1997 Baseline Monitoring Report

Groundwater and Soils Remediation Systems
Texaco Tutu Service Station
St. Thomas
U.S. Virgin Islands

17 December 1997

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Texaco Tutu Service Station - St. Thomas, U.S. Virgin Islands
Groundwater and Soils Remediation Systems
1997 Baseline Monitoring Report
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1. INTRODUCTION

1.1. Purpose

This report documents the baseline monitoring activities performed during the fall of 1997 prior to startup of the Texaco Tutu Service Station groundwater and soils remediation systems, St. Thomas, U.S. Virgin Islands. Groundwater elevations were measured and groundwater samples were collected at selected monitoring wells as outlined in the Start-up Monitoring Program (EKI, 1997). (For reference, Tables 1 and 4 are included in Appendix A.)

The groundwater samples were analyzed for aromatic and chlorinated volatile organic compounds. The potentiometric and chemical data provide a baseline "snapshot" of conditions in the vicinity of the Service Station prior to the start of remediation.

1.2. Report Organization

The topics addressed in this report include:

- Site Description And History
- Hydrology - including a discussion of historical groundwater elevation data as requested by DPNR in its 5 November 1997 letter to Texaco Caribbean Inc.
- DNAPL Issues
- Groundwater Analytical Data - October-November 1997
- Conclusions

2. SITE DESCRIPTION AND HISTORY

2.1. Location

The Texaco Tutu Service Station ("Service Station") is located in the upper Turpentine Run basin in Estate Anna's Retreat in east-central St. Thomas, U.S. Virgin Islands (Figures 1 and 2). The Service Station is located at the northeast corner of the intersection of Highways 38 and 384. Since it was built in 1964, the Service Station has been in continuous operation as a retail outlet for gasoline and diesel fuel.

2.2. Environmental Investigations

In 1987, it was suspected that petroleum hydrocarbons had been released from the Service Station's underground fuel storage tanks. These tanks and associated piping were removed in 1988 (Lebron Associates, 1990) and replaced with new storage and piping facilities at a different location in the west area of the Service Station.

During 1993 and 1994, environmental investigations were performed that revealed the occurrence of a plume of petroleum hydrocarbons in groundwater extending downgradient to the south of the Service Station. The gasoline constituents emanate, at least in part, from the location of the former underground storage tanks at the Texaco Tutu Service Station. Based upon Geraghty & Miller (1995), the chlorinated VOCs emanate from sources upgradient of the Service Station and have migrated to groundwater and soil gas beneath the Service Station.

2.3. Chemicals of Concern

The chemicals of concern consist of gasoline constituents and chlorinated volatile organic compounds:

Benzene	1,2-Dichloroethane ("1,2-DCA")	Vinyl Chloride ("VC")
Toluene	1,2-Dichloroethene ("1,2-DCE")	Methylene Chloride ("MC")
Ethylbenzene	Tetrachloroethene ("PCE")	
Xylenes	Trichloroethene ("TCE")	

2.4. Remediation System Construction

Two separate remediation systems were constructed. Construction was completed in the fall of 1997. The larger system was constructed at the Service Station and the smaller system was constructed on the Virgin Islands Telephone Company ("Vitelco") property located approximately 450 feet south of the Service Station, as shown on Figure 2.

Groundwater extraction wells were constructed at the down-gradient property line of the Service Station to remediate and limit migration of petroleum compounds. Groundwater extraction wells were also constructed near the northern boundary of the Vitelco property to control further migration of the petroleum hydrocarbon plume down-gradient of the Service Station. At each groundwater extraction location, treatment units are housed in self-contained units. Treated water will be discharged to the storm sewer under a TPDES permit.

At the Service Station, a soil vapor extraction ("SVE") system, including three SVE wells constructed in the vicinity of the former tank excavation, was constructed to remediate soil that contains elevated concentrations of petroleum hydrocarbons. A catalytic oxidizer will provide off-gas control. Extracted groundwater from two groundwater extraction wells will be treated by air stripping followed by catalytic oxidation for off-gas control. At the Vitleco property, extracted groundwater from two groundwater extraction wells will be treated by air-stripping.

3. HYDROLOGY

3.1. Water Bearing Units

The available hydrogeologic data indicate that the water-bearing units in the vicinity of the Service Station consist of fractured bedrock overlain by fine-grained sediments. These two units are hydraulically connected and the groundwater system is unconfined. Most groundwater production is from bedrock in zones of open fractures (Jordan and Cosner, 1973).

3.2. Historical Review of Groundwater Elevations

Limited historical groundwater elevation data are available for the vicinity of the Service Station. The available data for the time period between 1966 and 1994 include:

- Figure 4 - Observed Water Levels - January 1966, (Gartner Lee International, Inc., 1993)
- Figure 7 - Generalized Potentiometric Surface (9/11/87) Tutu Area, St. Thomas, Virgin Islands, (Geraghty & Miller, Inc. 1992)
- Water-Table Contour Map, In Feet Above Sea Level Upper Tutu Aquifer, March 24, 1992, (Hydrogeologic Associates U.S.A. Inc., 1993)
- Groundwater Contour Map, Shallow Wells May 23-24 1994, (Erler & Kalinowski, Inc., 1995a)

These contour maps are included in Appendix B. Another groundwater map from 1965 (Jordan and Cosner, 1973) was reviewed but not used in this analysis because of uncertainties in locating the Service Station on the map.

Prior to 1987 there were numerous commercial and supply wells operating in the Tutu valley. Between July and September 1987, DPNR closed 13 commercial and 5 private wells in the Tutu area (Geraghty & Miller, 1995). It is our understanding that pumping is ongoing in only one well (i.e., Four Winds I) at the present time.

Data for January 1966 (Appendix B, Figure 4, Gartner Lee International Inc., 1993) show a groundwater elevation at the Tutu Texaco Service Station of about 140 to 150 feet above sea level. In September 1987, after DPNR closed commercial and private wells, the groundwater elevation at the Service Station was about 165 feet (Appendix B, Figure 7, Geraghty & Miller, 1992). The September 1987 data set apparently represents the recovering groundwater potentiometric surface after the close of the wells. The March 1992 contour map (Appendix B, Hydrogeologic Associates. U.S.A. Inc., 1993) and the May

1994 contour map (EKI, 1995a) illustrate groundwater elevations at the Service Station on the order of 163-165 feet above sea level.

According to Geraghty & Miller (1995) there are seasonal groundwater elevation fluctuations on the order of approximately 2-5 feet based on water level measurements in Tutu valley wells taken during November 1992 and May 1994. The average annual rainfall in the Tutu area is about 42 inches with about half of the precipitation occurring in the months of August, September, October, and November although there are frequently below- or above-average years (Hamlin, 1985). The 1966 annual rainfall was slightly lower than average at 39.88 inches (Hamlin, 1985). Therefore, based on the 1966 groundwater contour map (Gartner Lee International, Inc., 1993) and a seasonal fluctuation of about 5 feet, the apparent historical low groundwater elevation at the Service Station is estimated to be approximately 140 feet above sea level. On the basis of groundwater elevation data from May 1994 and December 1997, the groundwater elevation at well MW-16, located upgradient of the Service Station, is about 5-10 feet higher than the Service Station groundwater elevation. Therefore, the apparent historical low groundwater elevation at well MW-16 is estimated to be approximately 145 feet above sea level.

3.3. Baseline Groundwater Elevations - 4 December 1997

Baseline groundwater level measurements were taken on 4 December 1997 by Fluor Daniel GTI. The groundwater level measurements and calculated groundwater elevations are summarized in Table 1. A groundwater contour map for baseline shallow wells (i.e. wells screened down to approximately 45 feet below ground surface) is shown on Figure 3. Note that well MW-2 was not gauged because a car reportedly was parked over it making the well inaccessible. Well MW-7 was not gauged because a Vitelco shipping container was apparently located over the well making it inaccessible. Data for the Tillet well are not contoured because the measuring point at the Tillet well (i.e., top of casing) has not been surveyed. The Four Winds I well level measurement reflects active pumping of groundwater from this well at the time groundwater level measurements were conducted. As shown on the groundwater contour map, Figure 3, the pumping of the Four Winds I well had a local effect on groundwater elevations measured at neighboring well CHT-1. Baseline groundwater elevation measurements were intended to be taken at well VE-1 (formerly TT-4; see Appendix A). However, well VE-3 was inadvertently measured instead of VE-1.

The difference between the known historical low groundwater elevation at the Service Station (approximately 140 feet above sea level) and the 4 December 1997 baseline elevation at groundwater monitoring well TT-1 of approximately 166 feet above sea level is approximately 26 feet. The difference between the known historical low groundwater elevation at monitoring well MW-16 (estimated to be approximately 145 feet above sea level) and the

4 December 1997 baseline groundwater elevation of approximately 178 feet above sea level is approximately 33 feet.

4. DNAPL ISSUES

4.1. DNAPL Presence

Review and evaluation of available groundwater data for chlorinated VOCs discussed in Geraghty & Miller (1995) indicates that there is a possibility that dense non-aqueous phase liquids (DNAPLs) are present in the Tutu area. Between September 1987 and January 1988, water samples from the Tillet well were reported to contain tetrachloroethylene ("PCE") at a concentration of 2,040 ug/L, greater than 1% of the maximum solubility of PCE in water. As discussed in Geraghty & Miller (1995), such concentrations are suggestive of DNAPL in the subsurface.

4.2. Well MW-16

Highest chemical concentrations in the vicinity of the Service Station have been detected in groundwater from monitoring well MW-16, which is located upgradient of the Service Station and north of the Curriculum Center. If DNAPL persists in the subsurface, it likely occurs in this area where chemical concentrations in groundwater are highest.

Because DNAPL mobilization is most likely to occur during periods of extreme hydraulic stress, groundwater extraction at the Service Station will be conducted such that groundwater head fluctuations do not exceed what has been experienced historically. For example, the Service Station system will be operated such that groundwater elevations at monitoring well MW-16 do not drop below an elevation of approximately 145 feet above sea level, the estimated historical low. Similarly the system will be operated such that downward gradients measured at the MW-1/MW-1D well pair do not exceed 26 feet which is the historical maximum downward gradient measured at these wells as reported in Geraghty & Miller, 1995.

5. GROUNDWATER ANALYTICAL DATA

5.1. Groundwater Sampling and Analysis

Most groundwater wells included in the Baseline Monitoring Program (See Table 1 of Appendix A and Figure 2) were sampled on 7 and 8 October 1997. Groundwater extraction wells TEW-2 and TEW-2D, located at the Vitelco property, were sampled on 20 November 1997. Power problems with the wells prevented sampling during the 7 and 8 October 1997 sampling event. Well MW-7 was not sampled because it could not be located. It is believed to be under a Vitelco shipping container. A groundwater sample was intended to be taken at well VE-1 (formerly TT-4; see Appendix A). However, well VE-3 was inadvertently sampled instead of VE-1. Sampling was performed by Fluor Daniel GTI and its subcontractor Caribbean Hydro-Tech Inc. Analyses were performed by NEI/GTEL.

Sample data, QC data, chain-of-custody forms, and field notes are included in Appendix C. Note that QC data are included only for samples from wells located at the Service Station taken on 7 and 8 October 1997. Note that some of the samples are shown as exceeding the hold time, (i.e., VE-3, shown on laboratory data sheets as

TT-4, MW-1, MW-1D, and MW-16.) However, since the exceedence was one day, the data are thought to be usable. The QC data for samples from wells TEW-2 and TEW-2D, located at the Vitelco property, are not currently available due to the closure of the NEI/GTEL laboratory in Florida. Therefore, data for these two samples have not been verified.

5.2. LNAPL

Monitoring wells TEW-1, TEW-1D, TT-2, and VE-3 were monitored for light, non-aqueous phase liquids ("LNAPL") using an oil-water interface probe. No LNAPL was detected in these wells.

5.3. Benzene Concentrations

The plume of gasoline constituents in groundwater that emanates from the area of the Service Station can be delineated by the extent of benzene in groundwater. This is the areal extent of groundwater that is targeted for remediation. Figure 4A presents the baseline groundwater data for benzene, toluene, ethylbenzene, and xylenes ("BTEX"). Figure 5A illustrates the areal extent of benzene based on the baseline groundwater data. Figure 5B shows the areal extent of benzene based on past groundwater data from May-June 1994.

Both data sets show that the highest concentrations of benzene were detected in groundwater from well TT-1: 16,000 ppb in October 1997 and 21,000 ppb in May-June 1994. The major difference between the two data sets is that benzene was not detected in groundwater from either the Vitelco Property shallow groundwater extraction well TEW-2 or deep groundwater extraction well TEW-2D. In 1994, 21 ppb of benzene was detected in groundwater at monitoring well MW-7 which is located approximately 20 feet east of groundwater extraction wells TEW-2 and TEW-2D.

5.4. Chlorinated VOC Concentrations

Chlorinated VOCs that have been discharged by other parties from upgradient sources will also be extracted as part of the groundwater extraction system and will be treated prior to discharge. Concentrations of total chlorinated VOCs detected in groundwater from the baseline sampling event are shown on Figure 6. The highest concentration of total chlorinated VOCs, 3,400 ppb, was detected in groundwater from well MW-16, comparable to the 1994 result of about 3,500 ppb. In general, the total chlorinated VOC concentrations detected in groundwater during the baseline sampling event are the same order of magnitude as the 1994 data (EKI, 1995a).

6. CONCLUSIONS

6.1. DNAPL

Historical and December 1997 baseline groundwater elevation data indicate that groundwater flow in the vicinity of the Service Station is to the south. The apparent low historical groundwater elevation at the Service Station is approximately 140 feet above sea level. The apparent low historical groundwater elevation at groundwater well MW-16 near the Curriculum Center is approximately 145 feet above sea level. During treatment system shakedown and start-up, the upgradient area near well MW-16, located near the Curriculum Center, will be closely monitored so as to mitigate against the potential for mobilizing DNAPL. The system will be operated such that groundwater elevations at well MW-16 do not drop below an elevation of approximately 145 feet above sea level. Similarly the system will be operated such that downward gradients measured at the MW-1/MW-1D well pair do not exceed approximately 26 feet.

6.2. Service Station Treatment System Operation

The baseline BTEX concentrations at the Service Station are, in general, lower than the BTEX concentrations that were used to develop treatment system influent design concentrations. LNAPL was not detected at wells TEW-1, TEW-1D, TT-2, or VE-3. Therefore, it does not appear that modifications to the Service Station groundwater extraction and treatment system or its operation are needed. Accordingly, the shakedown and start-up of the Service Station system will proceed as planned.

The baseline chlorinated VOC concentrations at the Service Station are significantly lower than the VOC concentrations that were used to develop treatment system influent design concentrations. It is possible that when the Service Station system begins operation, actual treatment system influent chlorinated VOC concentrations will be lower than influent design concentrations. Lower treatment system influent chlorinated VOC concentrations would result in less HCl being emitted from the catalytic oxidizer into the atmosphere. Therefore, it appears likely, based on the October - November 1997 baseline data, that less than 3 lbs/day of HCl would be emitted into the atmosphere. Therefore, no adjustments are required to the Service Station groundwater extraction and treatment system or its operation.

6.3. Vitelco Property Treatment System Operation

It does not appear that modifications to the Vitelco property treatment system or its operation are needed. BTEX compounds were not detected in groundwater from wells located at the Vitelco Property. Therefore, it appears that the gasoline plume does not extend to the Vitelco Property. TCI proposes to sample the Tillet well during the shakedown period to better define the leading edge of the plume. Accordingly, the shakedown and start-up of the Vitelco property treatment system will proceed as planned.

7. REFERENCES

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Jordon, D.G. and Cosner, O.J., 1973, A Survey of the Water Resources of St. Thomas Virgin Islands, U.S. Geological Survey Open-File Report, 1973, 55 pp.

Lebron Associates, January 1990, Final Report of Tanks Removal at Texaco Caribbean, Inc.'s Tutu St. Thomas, USVI Service Station, (with) Analysis of Laboratory Results for Soil Sampling Activities, Texaco Service Station, Tutu, St. Thomas, U.S. Virgin Islands.

TABLE 1

BASELINE GROUNDWATER ELEVATIONS

4 DECEMBER 1997

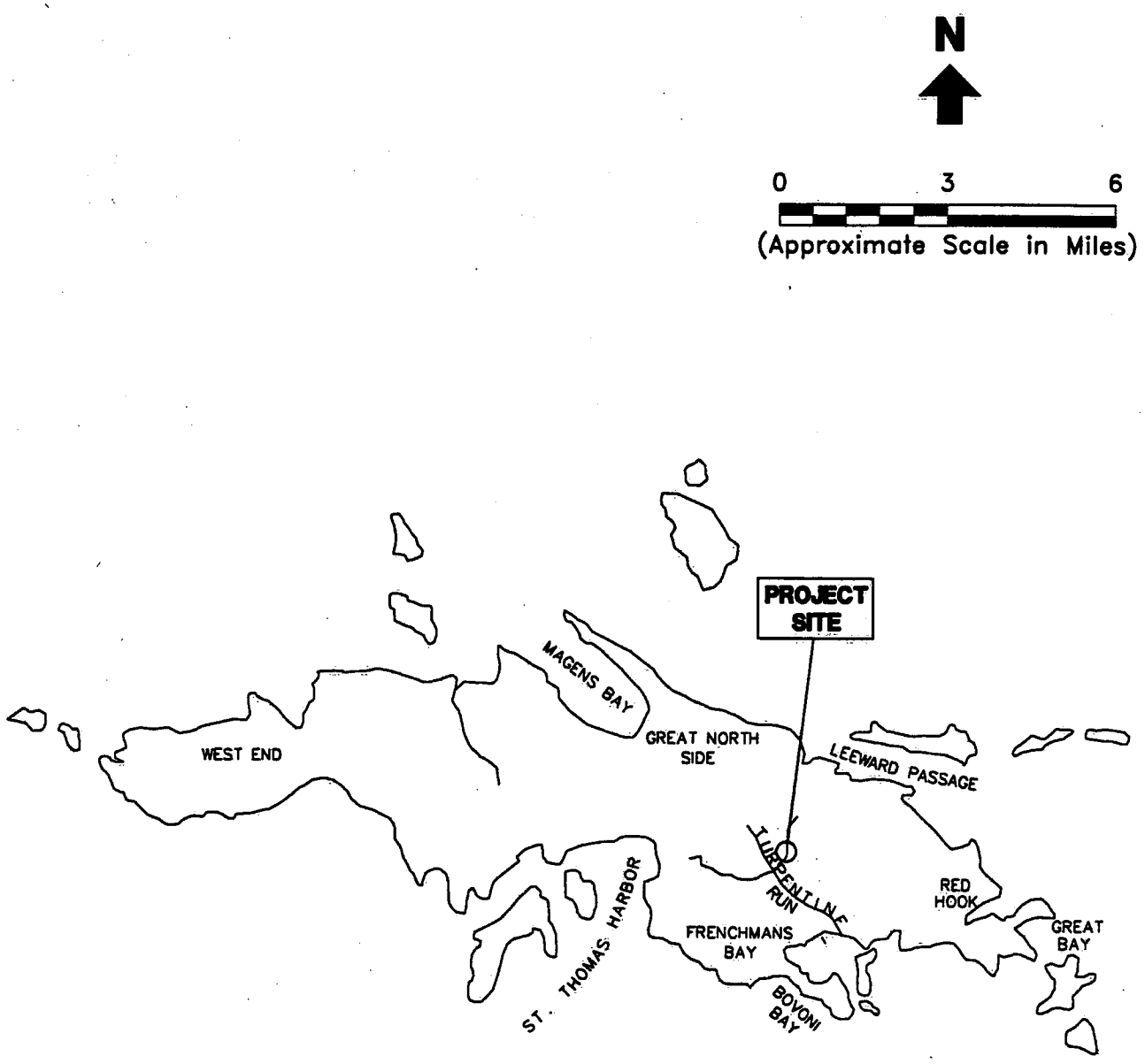
Texaco Tutu Service Station

St. Thomas, U.S. Virgin Islands

Well ID	Top of Casing Elevation (feet MSL)	Depth to Water (1) (feet)	Groundwater Elevation (feet MSL)
Texaco Service Station			
TT-1	179.03	13.00	166.03
TEW-1	176.99	10.89	166.10
TEW-1D	176.99	10.87	166.12
TT-2	179.69	12.14	167.55
TT-3D	181.75	13.68	168.07
TT-4 (VE-1)	179.66	11.25	168.41
TT-5	182.34	16.02	166.32
MW-3	181.84	14.12	167.72
MW-4	175.66	8.57	167.09
MW-4D	176.02	9.67	166.35
Viltelco Property			
TEW-2	178.21	14.46	163.75
TEW-2D	178.23	14.67	163.56
MW-7 (2)	180.13	-	-
North of Texaco Service Station			
MW-1	195.08	22.95	172.13
MW-1D	195.14	38.14	157.00
MW-2 (3)	178.15	-	-
MW-15	178.95	5.77	173.18
MW-16	202.33	24.46	177.87
MW-17	177.18	6.03	171.15
South of Texaco Service Station			
CHT-1	167.7	16.06	151.64
CHT-4	166.95	10.59	156.36
CHT-6D	174.20	8.97	165.23
MW-5	187.09	21.28	165.81
MW-6R	171.17	6.40	164.77
MW-6D	171.01	6.19	164.82
TT-6	169.18	6.31	162.87
Tillet (4)	186	22.71	-
Four Winds I (4 & 5)	166	27.62	-
Four Winds II (4)	165	9.87	-
Four Winds III (6)	NA	4.11	-

TABLE 1 - NOTES:

(1) Measurements were taken by Fluor Daniel GTI on 4 December 1997.
(2) Not measured; apparently covered by shipping container.
(3) Not measured; covered by automobile.
(4) Top of casing elevation is approximate.
(5) A pump in the Four Winds I well was operating on 4 December 1997.
(6) NA = Not Available
(7) Feet MSL - feet relative to mean sea level



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Location of Tutu Area, St. Thomas

Texaco Tutu Service Station
St. Thomas, U.S.V.I.
December 1997
EKI 940058.06
Figure 1

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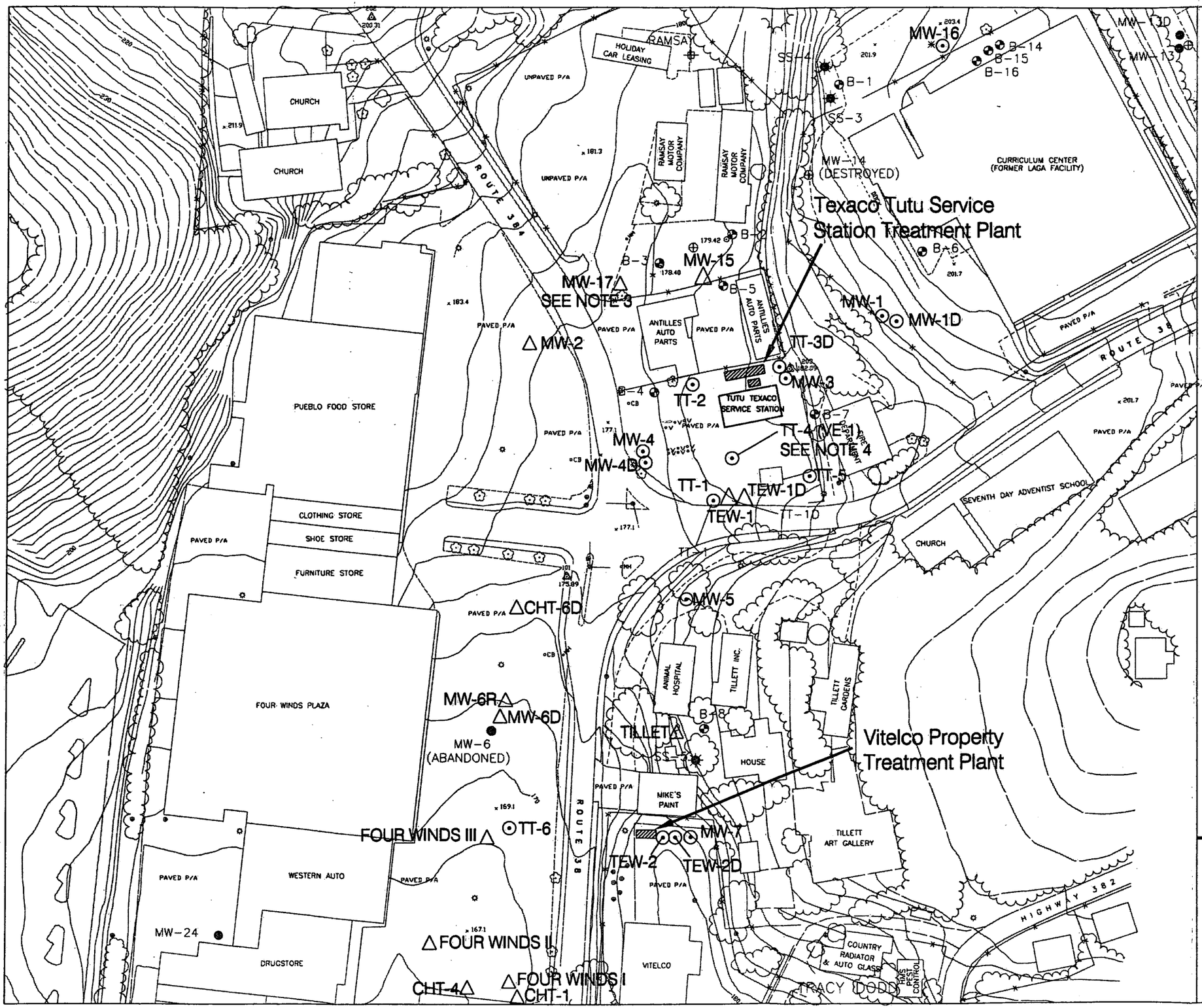

LEGEND

- MW-16 ⊙ Groundwater Monitoring Well – Groundwater Level Measurements Taken and Samples Collected
- MW-17 △ Groundwater Monitoring Well – Groundwater Level Measurements Taken
- MW-1 ● Shallow Monitoring Well Location
- MW-6D ● Deep Monitoring Well Location
- EGLIN-1 ⊕ Supply Well Location
- CHT-6D ◒ Monitoring Well Location Installed by Caribbean Hydro-Tech, Inc.
- REMW-2 Φ Rodriquez Esso Service Station Monitoring Well Location Installed by Tech Corporation
- SW-4 ⊖ Shallow Monitoring Well Location Installed by Blasland & Bouck, Inc.
- DW-1 ⊖ Deep Monitoring Well Location Installed by Blasland & Bouck, Inc.
- TT-5 ⊙ Monitoring Well Location Installed in 1993 by H & GCL
- B-12 ⊕ Soil Boring Location
- SS-8 ✸ Surface Soil Sample Approximate Location
- OHMW-4 ⊙ O'Henri Monitoring Well Location
- 175.89 △ Existing Control Monument (elevation in feet above mean sea level)
- ✱ Well Location is Approximate

Notes:

1. All locations are approximate.
2. Base map provided by Geraghty & Miller.
3. Transducers are proposed to be installed in wells MW-17, TEW-1, TEW-1D, TEW-2, TEW-2D, and MW-7 during baseline monitoring following systems shakedown.
4. Existing monitoring well TT-4 was retrofitted as new soil vapor extraction well VE-1.

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Groundwater Monitoring Well Locations

Texaco Tutu Service Station
St. Thomas, U.S.V.I.
December 1997
EKI 940058.06
Figure 2

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MW-16	
Compound	Concentration (ug/l)
Benzene	<5.0
Toluene	<5.0
Ethylbenzene	<5.0
Xylenes	<5.0

MW-1	
Compound	Concentration (ug/l)
Benzene	<5.0
Toluene	<5.0
Ethylbenzene	<5.0
Xylenes	<5.0

TT-2	
Compound	Concentration (ug/l)
Benzene	<5.0
Toluene	<5.0
Ethylbenzene	<5.0
Xylenes	<5.0

MW-4	
Compound	Concentration (ug/l)
Benzene	<5.0
Toluene	<5.0
Ethylbenzene	<5.0
Xylenes	<5.0

MW-4D	
Compound	Concentration (ug/l)
Benzene	<5.0
Toluene	<5.0
Ethylbenzene	<5.0
Xylenes	<5.0

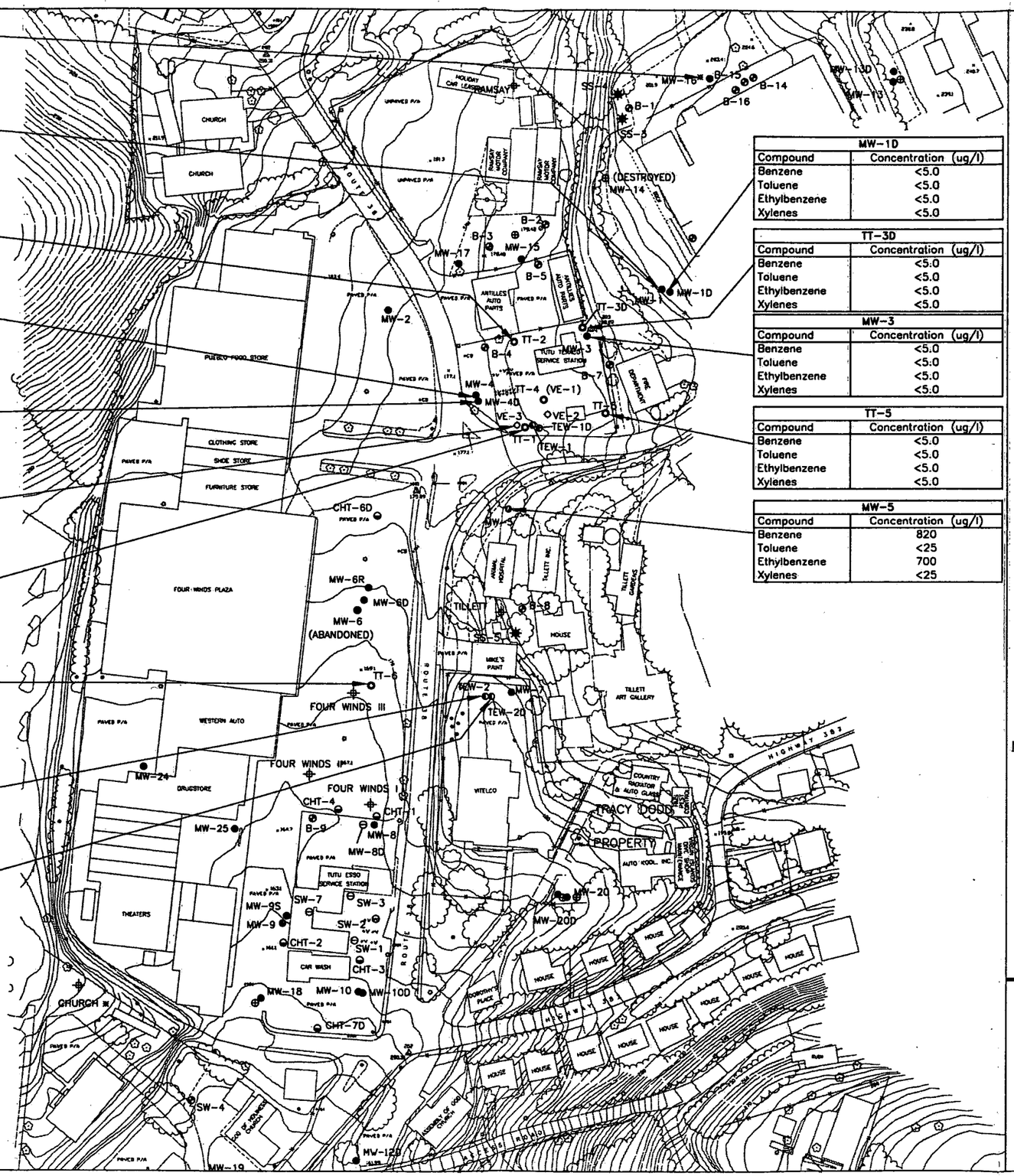
VE-3	
Compound	Concentration (ug/l)
Benzene	2,400
Toluene	51
Ethylbenzene	700
Xylenes	460

TT-1	
Compound	Concentration (ug/l)
Benzene	16,000
Toluene	17,000
Ethylbenzene	3,300
Xylenes	17,000

TT-6	
Compound	Concentration (ug/l)
Benzene	<5.0
Toluene	<5.0
Ethylbenzene	<5.0
Xylenes	<5.0

TEW-2	
Compound	Concentration (ug/l)
Benzene	<5.0
Toluene	<5.0
Ethylbenzene	<5.0
Xylenes	<5.0

TEW-2D	
Compound	Concentration (ug/l)
Benzene	<5.0
Toluene	<5.0
Ethylbenzene	<5.0
Xylenes	<5.0



LEGEND

- MW-1 ● Shallow Monitoring Well Location
- MW-6D ● Deep Monitoring Well Location
- EGLIN-1 ⊕ Supply Well Location
- CHT-6D ◒ Monitoring Well Location Installed by Caribbean Hydro-Tech, Inc.
- REMW-2 ⊕ Rodriquez Esso Service Station Monitoring Well Location Installed by Tech Corporation
- SW-4 ⊖ Shallow Monitoring Well Location Installed by Blasland & Bouck, Inc.
- DW-1 ⊖ Deep Monitoring Well Location Installed by Blasland & Bouck, Inc.
- TT-5 ○ Monitoring Well Location Installed in 1993 by H & GCL
- B-12 ◔ Soil Boring Location
- SS-8 ✸ Surface Soil Sample Approximate Location
- OHMW-4 ⊙ O'Henri Monitoring Well Location
- 175.89 △ Existing Control Monument (elevation in feet above mean sea level)
- ✱ Well Location is Approximate
- ◇ Soil Vapor Extraction Well Installed By EKI in 1996
- ◐ Groundwater Extraction Well Installed By EKI in 1996

Notes

1. All locations are approximate.
2. Base map provided by Geraghty & Miller.
3. MW-7 was not sampled because the well was covered by a shipping container.
4. MW-2 was not sampled because the well was covered by an automobile.
5. VE-3 was inadvertently sampled instead of TT-4 (VE-1).

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BTEX Concentrations in Groundwater October to November 1997

Texaco Tutu Service Station
St. Thomas, U.S.V.I.
December 1997
EKI 940058.06
Figure 4

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Concentrations of Benzene (ug/L) Detected in Groundwater October to November 1997

Texaco Tutu Service Station
St. Thomas, U.S.V.I.

December 1997
EKI 940058.06

Figure 5A

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N

0 100 200

(Approximate Scale in Feet)

LEGEND

- MW-1 ● Shallow Monitoring Well Location
- MW-6D ● Deep Monitoring Well Location
- EGLIN-I ⊕ Supply Well Location
- CHT-6D ⊖ Monitoring Well Location Installed by Caribbean Hydro-Tech, Inc.
- REMW-2 ⊕ Rodriquez Esso Service Station Monitoring Well Location Installed by Tech Corporation
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- SS-8 ✸ Surface Soil Sample Approximate Location
- OHMW-4 ⊙ O'Henri Monitoring Well Location
- 175.89 △ Existing Control Monument (elevation in feet above mean sea level)
- ✱ Well Location is Approximate
- (21,000) Chemical Concentration in ug/L (ppb)
- (ND) Not Detected Above Laboratory Detection Limit
- —10— Isoconcentration Contour, Dashed Where Uncertain

Notes

1. All locations are approximate.
2. Base map provided by Geraghty & Miller.

Erler & Kalinowski, Inc.

Concentrations of Benzene (ug/L) Detected in Groundwater May-June 1994

Texaco Tutu Service Station
St. Thomas, U.S.V.I.

December 1997
EKI 940058.06

Figure 5B

97 Dec 17 13:55:00 G:\940058.06\Dec97\Fig-5b.dwg

MW-16	
Compound	Concentration (ug/l)
1,2-DCA	<5.0
1,2-DCE	2,900
PCE	190
TCE	200
VC	77
MC	<5.0

MW-1	
Compound	Concentration (ug/l)
1,2-DCA	<5.0
1,2-DCE	310
PCE	300
TCE	47
VC	<10
MC	<5.0

TT-2	
Compound	Concentration (ug/l)
1,2-DCA	<5.0
1,2-DCE	51
PCE	27
TCE	6.6
VC	<10
MC	<5.0

MW-4	
Compound	Concentration (ug/l)
1,2-DCA	<5.0
1,2-DCE	25
PCE	10
TCE	<5.0
VC	<10
MC	<5.0

MW-4D	
Compound	Concentration (ug/l)
1,2-DCA	<5.0
1,2-DCE	18
PCE	5.1
TCE	<5.0
VC	<10
MC	<5.0

VE-3	
Compound	Concentration (ug/l)
1,2-DCA	<25
1,2-DCE	<25
PCE	<25
TCE	<25
VC	<50
MC	<25

TT-6	
Compound	Concentration (ug/l)
1,2-DCA	<5.0
1,2-DCE	150
PCE	120
TCE	21
VC	<10
MC	<5.0

TEW-2	
Compound	Concentration (ug/l)
1,2-DCA	<5.0
1,2-DCE	23
PCE	29
TCE	<5.0
VC	<10
MC	<5.0

MW-1D	
Compound	Concentration (ug/l)
1,2-DCA	<5.0
1,2-DCE	540
PCE	200
TCE	54
VC	27
MC	<5.0

TT-3D	
Compound	Concentration (ug/l)
1,2-DCA	<5.0
1,2-DCE	140
PCE	74
TCE	15
VC	13
MC	<5.0

MW-3	
Compound	Concentration (ug/l)
1,2-DCA	<5.0
1,2-DCE	100
PCE	26
TCE	6.8
VC	10
MC	<5.0

TT-5	
Compound	Concentration (ug/l)
1,2-DCA	<5.0
1,2-DCE	140
PCE	15
TCE	17
VC	13
MC	<5.0

TT-1	
Compound	Concentration (ug/l)
1,2-DCA	<500
1,2-DCE	<500
PCE	<500
TCE	<500
VC	<1,000
MC	<500

MW-5	
Compound	Concentration (ug/l)
1,2-DCA	<25
1,2-DCE	<25
PCE	<25
TCE	<25
VC	<50
MC	<25

TEW-2D	
Compound	Concentration (ug/l)
1,2-DCA	<5.0
1,2-DCE	31
PCE	36
TCE	5.1
VC	<10
MC	<5.0

N

0 150 300

(Approximate Scale in Feet)

LEGEND

- MW-1 ● Shallow Monitoring Well Location
- MW-6D ● Deep Monitoring Well Location
- EGLIN-1 ⊕ Supply Well Location
- CHT-6D ⊖ Monitoring Well Location Installed by Caribbean Hydro-Tech, Inc.
- REMW-2 ⊖ Rodriquez Esso Service Station Monitoring Well Location Installed by Tech Corporation
- SW-4 ⊖ Shallow Monitoring Well Location Installed by Blasland & Bouck, Inc.
- DW-1 ⊖ Deep Monitoring Well Location Installed by Blasland & Bouck, Inc.
- TT-5 ○ Monitoring Well Location Installed in 1993 by H & GCL
- B-12 ⊘ Soil Boring Location
- SS-8 ✸ Surface Soil Sample Approximate Location
- OHMW-4 ⊙ O'Henri Monitoring Well Location
- 175.89 △ Existing Control Monument (elevation in feet above mean sea level)
- ✱ Well Location is Approximate
- VC Vinyl Chloride
- MC Methylene Chloride
- ◇ Soil Vapor Extraction Well Installed By EKI in 1996
- ◐ Groundwater Extraction Well Installed By EKI in 1996

Notes

1. All locations are approximate.
2. Base map provided by Geraghty & Miller.
3. MW-7 was not sampled because the well was covered by a shipping container.
4. MW-2 was not sampled because the well was covered by an automobile.
5. VE-3 was inadvertently sampled instead of TT-4 (VE-1).

Erler & Kalinowski, Inc.

Chlorinated VOC Concentrations in Groundwater October to November 1997

Texaco Tutu Service Station
St. Thomas, U.S.V.I.
December 1997
EKI 940058.06
Figure 6

97 Dec 17 13:56:24 G:\940058.06\Dec97\Fig-6.dwg

Appendix A - Start-Up Monitoring Program Tables 1 & 4

Table 1

Baseline Groundwater Monitoring

Tutu Texaco Service Station
U.S. Virgin Islands
(EKI 940058.06)

Well ID	Baseline Monitoring			
	Water Level Measurement (1 &3)	Groundwater Sampling (1)	Transducer Installation (4)	LNAPL Monitoring
Texaco Service Station				
TT-1	X	X		
TEW-1	X		X	X
TEW-1D	X		X	X
TT-2	X	X		X
TT-3D	X	X		
TT-4 (VE-1) (5)	X	X		
TT-5	X	X		
MW-3	X	X		
MW-4	X	X		
MW-4D	X	X		
Viltelco Property				
TEW-2	X	X	X	
TEW-2D	X	X	X	
MW-7	X	X	X	
North of Texaco Service Station				
MW-1	X	X		
MW-1D	X	X		
MW-2	X			
MW-15	X			
MW-16	X	X		
MW-17	X		X	
South of Texaco Service Station				
CHT-1	X			
CHT-4	X			
CHT-6D	X			
MW-5	X	X		
MW-6R	X			
MW-6D	X			
TT-6	X	X		
Tillet	X			
Four Winds I	X			
Four Winds II	X			
Four Winds III	X			

Notes:

1. Groundwater levels and samples will be taken prior to shakedown of the Vitelco and Tutu Texaco Service Service Station groundwater extraction and treatment systems. See text for description of "shakedown" period.
2. Groundwater samples will be analyzed for volatile organic compounds using EPA Test Method 8240.
3. Groundwater levels only will be taken following shakedown of the Vitelco and Tutu Texaco Service Station groundwater extraction and treatment systems.
4. Transducers will be used during baseline monitoring following shakedown of the Vitelco and Tutu Texaco Service Station groundwater extraction and treatment systems.
5. Existing monitoring well TT-4 will be retrofitted to be a new soil vapor extraction well and will be renamed VE-1.
6. Monitoring plan is subject to modification.

Table 4

Groundwater Monitoring During Start-Up of Texaco Station and Viltelco Property Groundwater Extraction and Treatment Systems Operation

Tutu Texaco Service Station
U.S. Virgin Islands
(EKI 940058.06)

Well ID	Water Level Monitoring Schedule				Groundwater Sampling	LNAPL
	0-2 Weeks			2 Weeks - 6 Months	0-6 Months	0-6 Months
	Days 1 and 2 (1) (event/day)	Days 3 through 7 (1) (event/day)	Second Week (2) (event/week)	(3)	(4)	(4)
Texaco Service Station						
TT-1	4x	2x	3x	X	X	
TEW-1	Transducer	Transducer	Transducer	X		X
TEW-1D	Transducer	Transducer	Transducer	X		X
TT-2	4x	2x	3x	X	X	
TT-3D	4x	2x	3x	X	X	
TT-4 (VE-1) (5)	4x	2x	3x	X	X	
TT-5	4x	2x	3x	X	X	
MW-3	4x	2x	3x	X	X	
MW-4	4x	2x	3x	X	X	
MW-4D	4x	2x	3x	X	X	
Viltelco Property						
TEW-2	Transducer	Transducer	Transducer	X	X	
TEW-2D	Transducer	Transducer	Transducer	X	X	
MW-7	Transducer	Transducer	Transducer	X	X	
North of Texaco Service Station						
MW-1	2x	1x	3x	X	X	
MW-1D	2x	1x	3x	X	X	
MW-2	2x	1x	3x	X		
MW-15	2x	1x	3x	X		
MW-16	2x	1x	3x	X	X	
MW-17	Transducer	Transducer	Transducer	X		

Table 4

Groundwater Monitoring During Start-Up of Texaco Station and Viltelco Property Groundwater Extraction and Treatment Systems Operation

Tutu Texaco Service Station
U.S. Virgin Islands
(EKI 940068.06)

Well ID	Water Level Monitoring Schedule				Groundwater Sampling
	0-2 Weeks			2 Weeks - 6 Months	0-6 Months
	Days 1 and 2 (1) (event/day)	Days 3 through 7 (1) (event/day)	Second Week (2) (event/week)	(3)	(4)
South of Texaco Service Station					
CHT-1	2x	1x	3x	X	
CHT-4	2x	1x	3x	X	
CHT-6D	4x	2x	3x	X	
MW-5	4x	2x	3x	X	X
MW-6R	4x	2x	3x	X	
MW-6D	4x	2x	3x	X	
TT-6	2x	1x	3x	X	X
Tillet	4x	2x	3x	X	
Four Winds I	2x	1x	3x	X	
Four Winds II	2x	1x	3x	X	
Four Winds III	2x	1x	3x	X	

Notes:

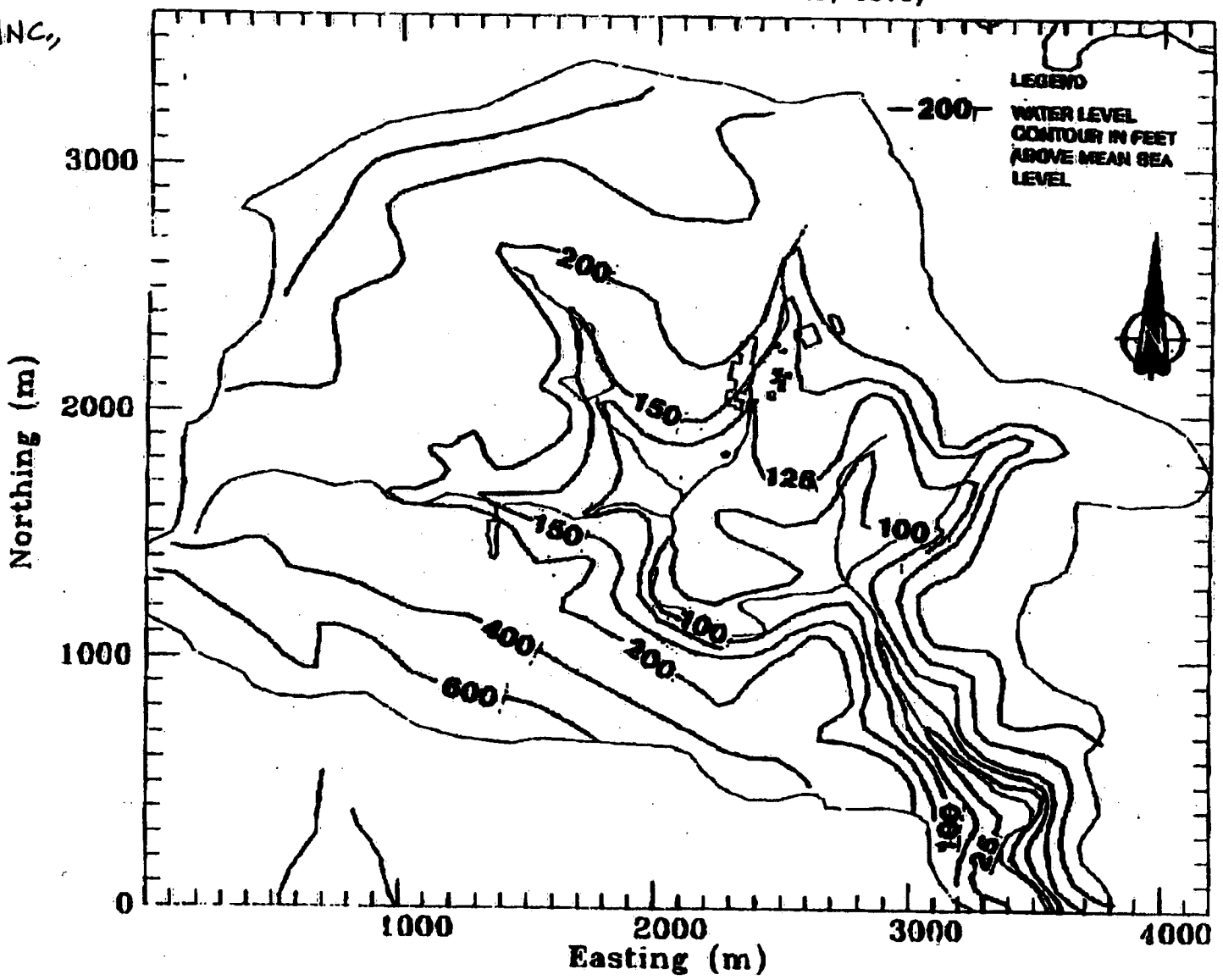
1. Level measurement activities will be equally spaced throughout a standard work day.
2. Level measurement activities will be equally spaced throughout a standard work week.
3. Level measurement activities will be performed monthly during the period of 2 weeks to 6 months.
4. Groundwater sampling will be performed once during the first month and quarterly thereafter. Samples will be analyzed using EPA Test Method 8240.
5. Existing monitoring well TT-4 will be retrofitted to be a new soil vapor extraction well and will be renamed VE-1.
6. Monitoring plan is subject to modification.

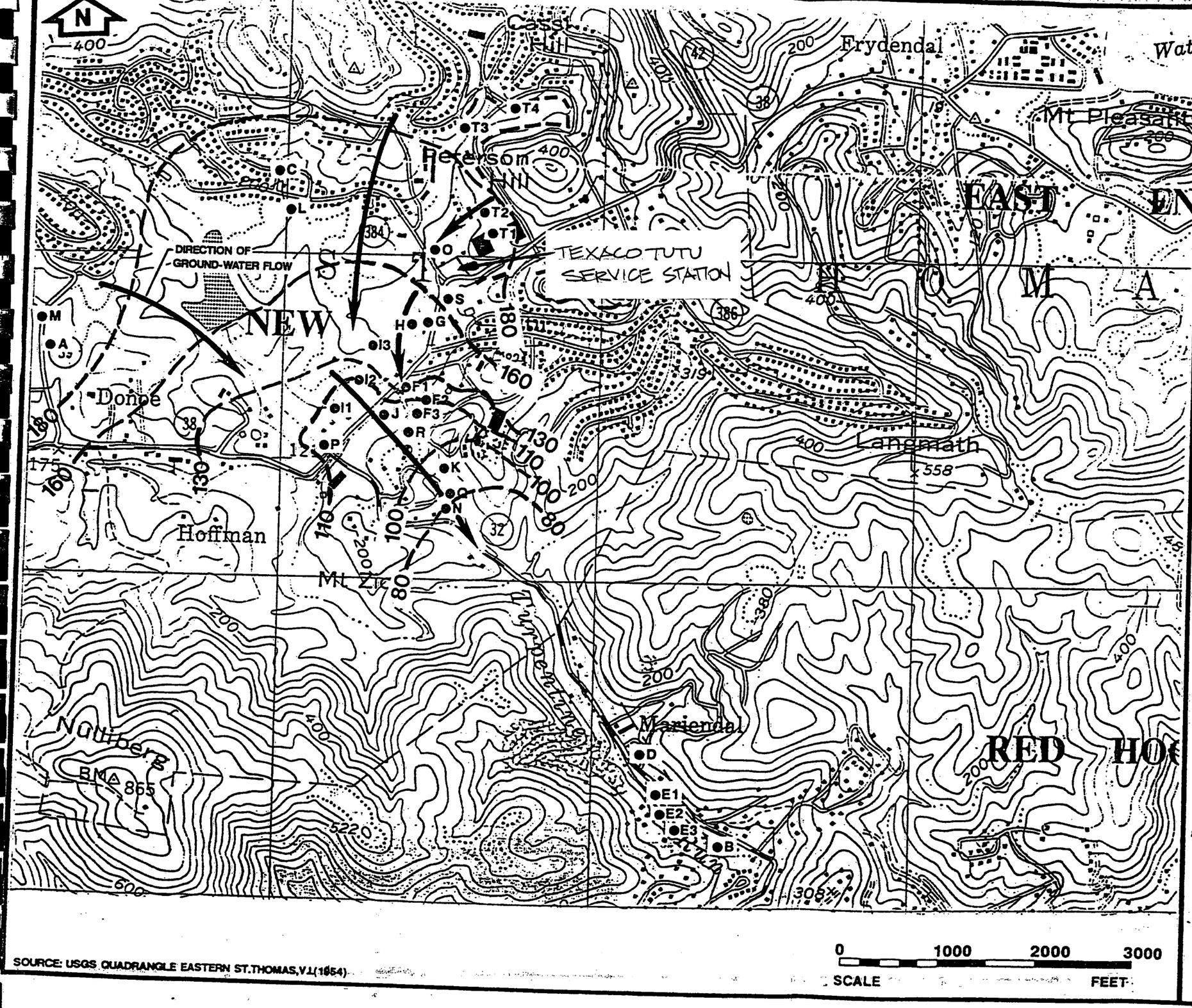
Appendix B - Historical Groundwater Elevation Data

SOURCE:
GARTNER LEE
INTERNATIONAL, INC.,
1993

Figure 4. Observed Water Levels – January 1966

(Data from Jorden and Cosner, 1973)





SOURCE: USGS QUADRANGLE EASTERN ST.THOMAS,V.I.(1954)

LEGEND

- ● RESIDENTIAL WELL
- A BRYAN
- B DEDE
- C DEMITRI
- D DENCH
- E1 DEVCON I
- E2 DEVCON II (ALTERNATE)
- E3 DEVCON III
- F1 EGLIN I
- F2 EGLIN II
- F3 EGLIN III
- G FOUR WINDS I
- H FOUR WINDS II
- I1 GASSETT
- I2 HARTMAN II (CRUSHER)
- I3 HARTMAN III (ESTATE)
- J HARVEY
- K LaPLACE
- L LEONARD
- M LOCKHART (ALTERNATE)
- N MATTHIAS
- O RAMSEY
- P RODRIGUES
- Q SMITH
- R STEELE
- S TILLETT
- T1 VIHA I
- T2 VIHA II (ALTERNATE)
- T3 VIHA III
- T4 VIHA IV (ALTERNATE)
- 160 LINE OF EQUAL GROUND-WATER LEVEL ELEVATION (FEET ABOVE MEAN SEA LEVEL) (MODIFIED AFTER GRAVES AND GONZALEZ 1988)

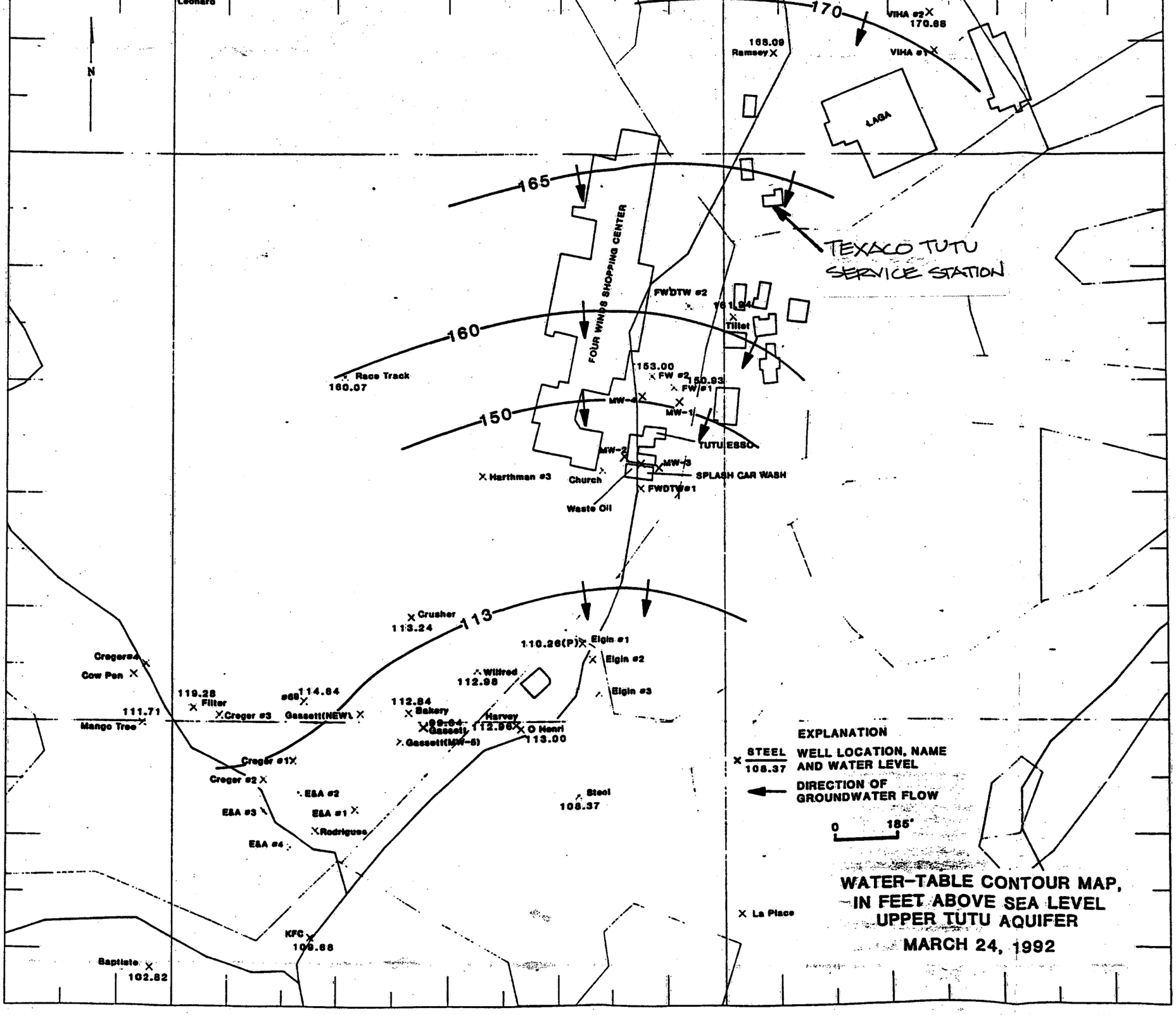
SUBJECT

GENERALIZED POTENTIOMETRIC SURFACE (9/11/87) TUTU AREA, ST. THOMAS, U. S. VIRGIN ISLANDS

PREPARED FOR

TEIC

Geraghty & Miller, Inc.	COMPILED BY	DANAHY	SCALE	FIGURE
	PREPARED BY	PADULA	SHOWN	7
	PROJECT MGR	DANAHY	DATE 5/90	



WATER-TABLE CONTOUR MAP, IN FEET ABOVE SEA LEVEL UPPER TUTU AQUIFER MARCH 24, 1992

SOURCE:
HYDROGEOLOGIC ASSOCIATES U.S.A., INC., 1993

N

0 150 300

(Approximate Scale in Feet)

LEGEND

MW-1 ●	Shallow Monitoring Well Location
MW-6D ●	Deep Monitoring Well Location
EGLIN-I ⌖	Supply Well Location
CHT-6D ⊖	Monitoring Well Location Installed by Caribbean Hydro-Tech, Inc.
REMW-2 ⦶	Rodriquez Esso Service Station Monitoring Well Location Installed by Tech Corporation
SW-4 ⊖	Shallow Monitoring Well Location Installed by Blasland & Bouck, Inc.
DW-1 ⊖	Deep Monitoring Well Location Installed by Blasland & Bouck, Inc.
TT-5 ○	Monitoring Well Location Installed in 1993 by H & GCL
B-12 ⊕	Soil Boring Location
SS-8 ✱	Surface Soil Sample Approximate Location
OHMW-4 ⊙	O'Henri Monitoring Well Location
175.89 ▲	Existing Control Monument (elevation in feet above mean sea level)
✱	Well Location is Approximate
▬▬	Groundwater Contour from Geraghty and Miller May 1994
──►	Groundwater Flow Direction

Notes
1. All locations are approximate.
2. Base map provided by GCM.

Erler & Kalinowski, Inc.

Groundwater Contour Map,
Shallow Wells May 23-24 1994

Texaco Tutu Service Station
St. Thomas, U.S.V.I.
April 1995
EKI 940058.00

Figure 5

Appendix C - Laboratory Analytical Data & Field Notes

NEI/GTEL
ENVIRONMENTAL LABORATORIES, INC.
Southeast Region
10500 University Center Drive, Suite 160
Tampa, FL 33612
(813) 979-9092 800-933-GTEL (4835)
FAX: 813-979-6914

MASTER COPY

October 21, 1997

Dale Mcfarland
FLUOR DANIEL GTI
5553 Ravenswood Rd
Fort Lauderdale, FL 33312

RE: NEI/GTEL Client ID: 100212
Login Number: F7100092
Project ID (number): 100212
Project ID (name): TEXACO TUTU

Dear Dale Mcfarland:

Enclosed please find the analytical results for the samples received by NEI/GTEL Environmental Laboratories, Inc. on 10/09/97 under Chain-of-Custody Number(s) 42096-42095.

A formal Quality Assurance/Quality Control (QA/QC) program is maintained by NEI/GTEL, which is designed to meet or exceed the EPA requirements. Analytical work for this project met QA/QC criteria unless otherwise stated in the footnotes. This Analytical report shall not be reproduced except in full.

GTEL is certified (approved) by the State of Florida under Certification Number HRS E84196, by the State of South Carolina under Certificate Number 96025, and by the State of Tennessee for UST list.

If you have any questions regarding this analysis, or if we can be of further assistance, please call our Customer Service Representative.

Sincerely,
NEI/GTEL Environmental Laboratories, Inc.

J. Peter Barto
General Manager

NEI/GTEL Client ID: 100212
Login Number: F7100092
Project ID (number): 100212
Project ID (name): TEXACO TUTU

ANALYTICAL RESULTS

Volatile Organics
Method: EPA 8240
Matrix: NotPres AQ

NEI/GTEL Sample Number		F7100092-01	F7100092-02	F7100092-03	F7100092-04
Client ID		TT-6	MW-5	MW-3	TT-3B
Date Sampled		10/07/97	10/07/97	10/07/97	10/07/97
Date Analyzed		10/14/97	10/17/97	10/14/97	10/17/97
Dilution Factor		1.00	5.00	1.00	1.00
Analyte	Reporting Limit / Units	Concentration:			
Chloromethane	10. ug/L	< 10.	< 50.	< 10.	< 10.
Bromomethane	10. ug/L	< 10.	< 50.	< 10.	< 10.
Vinyl chloride	10. ug/L	< 10.	< 50.	10.	13.
Chloroethane	10. ug/L	< 10.	< 50.	< 10.	< 10.
Methylene chloride	5.0 ug/L	< 5.0	< 25.	< 5.0	< 5.0
Acetone	20. ug/L	< 20.	130	< 20.	< 20.
Carbon disulfide	5.0 ug/L	< 5.0	< 25.	< 5.0	< 5.0
1,1-Dichloroethene	5.0 ug/L	< 5.0	< 25.	< 5.0	< 5.0
1,1-Dichloroethane	5.0 ug/L	< 5.0	< 25.	< 5.0	< 5.0
1,2-Dichloroethene (total)	5.0 ug/L	150	< 25.	100	140
Chloroform	5.0 ug/L	< 5.0	< 25.	< 5.0	< 5.0
1,2-Dichloroethane	5.0 ug/L	< 5.0	< 25.	< 5.0	< 5.0
2-Butanone	20. ug/L	< 20.	< 100	< 20.	< 20.
1,1,1-Trichloroethane	5.0 ug/L	< 5.0	< 25.	< 5.0	< 5.0
Carbon tetrachloride	5.0 ug/L	< 5.0	< 25.	< 5.0	< 5.0
Vinyl acetate	20. ug/L	< 20.	< 100	< 20.	< 20.
Bromodichloromethane	5.0 ug/L	< 5.0	< 25.	< 5.0	< 5.0
1,2-Dichloropropane	5.0 ug/L	< 5.0	< 25.	< 5.0	< 5.0
cis-1,3-Dichloropropene	5.0 ug/L	< 5.0	< 25.	< 5.0	< 5.0
Trichloroethene	5.0 ug/L	21.	< 25.	6.8	15.
Dibromochloromethane	5.0 ug/L	< 5.0	< 25.	< 5.0	< 5.0
1,1,2-Trichloroethane	5.0 ug/L	< 5.0	< 25.	< 5.0	< 5.0
Benzene	5.0 ug/L	< 5.0	820	< 5.0	< 5.0
2-Chloroethyl vinyl ether	10. ug/L	< 10.	< 50.	< 10.	< 10.
trans-1,3-Dichloropropene	5.0 ug/L	< 5.0	< 25.	< 5.0	< 5.0
Bromoform	5.0 ug/L	< 5.0	< 25.	< 5.0	< 5.0
4-Methyl-2-pentanone	20. ug/L	< 20.	< 100	< 20.	< 20.
2-Hexanone	20. ug/L	< 20.	< 100	< 20.	< 20.
Tetrachloroethene	5.0 ug/L	120	< 25.	26.	74.
1,1,2,2-Tetrachloroethane	5.0 ug/L	< 5.0	< 25.	< 5.0	< 5.0
Toluene	5.0 ug/L	< 5.0	< 25.	< 5.0	< 5.0
Chlorobenzene	5.0 ug/L	< 5.0	< 25.	< 5.0	< 5.0
Ethylbenzene	5.0 ug/L	< 5.0	700	< 5.0	< 5.0
Styrene	5.0 ug/L	< 5.0	< 25.	< 5.0	< 5.0
Xylenes (total)	5.0 ug/L	< 5.0	< 25.	< 5.0	< 5.0
1,3-Dichlorobenzene	10. ug/L	< 10.	< 50.	< 10.	< 10.
1,4-Dichlorobenzene	10. ug/L	< 10.	< 50.	< 10.	< 10.
1,2-Dichlorobenzene	10. ug/L	< 10.	< 50.	< 10.	< 10.

Notes:
NEI/GTEL Tampa, FL
F7100092:1

NEI/GTEL Client ID: 100212
Login Number: F7100092
Project ID (number): 100212
Project ID (name): TEXACO TUTU

ANALYTICAL RESULTS

Volatile Organics
Method: EPA 8240
Matrix: NotPres AQ

NEI/GTEL Sample Number	F7100092-01	F7100092-02	F7100092-03	F7100092-04
Client ID	TT-6	MW-5	MW-3	TT-30
Date Sampled	10/07/97	10/07/97	10/07/97	10/07/97
Date Analyzed	10/14/97	10/17/97	10/14/97	10/17/97
Dilution Factor	1.00	5.00	1.00	1.00

Analyte	Reporting Limit	Units	Concentration:

Notes: (continued)

Dilution Factor:
Dilution factor indicates the adjustments made for sample dilution.

EPA 8240:
"Test Methods for Evaluating Solid Waste. Physical/Chemical Methods". SW-846. Third Edition including Update 1. Analyte list modified to include additional compounds.

NEI/GTEL Client ID: 100212
Login Number: F7100092
Project ID (number): 100212
Project ID (name): TEXACO TUTU

ANALYTICAL RESULTS

Volatile Organics
Method: EPA 8240
Matrix: NotPres AQ

NEI/GTEL Sample Number		F7100092-05	F7100092-06	F7100092-07	F7100092-08
Client ID		TT-5	TT-1	TT-2	MW-4
Date Sampled		10/07/97	10/07/97	10/07/97	10/07/97
Date Analyzed		10/17/97	10/17/97	10/17/97	10/17/97
Dilution Factor		1.00	100	1.00	1.00
Analyte	Reporting Limit / Units	Concentration:			
Chloromethane	10. ug/L	< 10.	< 1000	< 10.	< 10.
Bromomethane	10. ug/L	< 10.	< 1000	< 10.	< 10.
Vinyl chloride	10. ug/L	13.	< 1000	< 10.	< 10.
Chloroethane	10. ug/L	< 10.	< 1000	< 10.	< 10.
Methylene chloride	5.0 ug/L	< 5.0	< 500	< 5.0	< 5.0
Acetone	20. ug/L	34.	< 2000	< 20.	< 20.
Carbon disulfide	5.0 ug/L	< 5.0	< 500	< 5.0	< 5.0
1,1-Dichloroethene	5.0 ug/L	< 5.0	< 500	< 5.0	< 5.0
1,1-Dichloroethane	5.0 ug/L	< 5.0	< 500	< 5.0	< 5.0
1,2-Dichloroethene (total)	5.0 ug/L	140	< 500	51.	25.
Chloroform	5.0 ug/L	< 5.0	< 500	< 5.0	< 5.0
1,2-Dichloroethane	5.0 ug/L	< 5.0	< 500	< 5.0	< 5.0
2-Butanone	20. ug/L	< 20.	< 2000	< 20.	< 20.
1,1,1-Trichloroethane	5.0 ug/L	< 5.0	< 500	< 5.0	< 5.0
Carbon tetrachloride	5.0 ug/L	< 5.0	< 500	< 5.0	< 5.0
Vinyl acetate	20. ug/L	< 20.	< 2000	< 20.	< 20.
Bromodichloromethane	5.0 ug/L	< 5.0	< 500	< 5.0	< 5.0
1,2-Dichloropropane	5.0 ug/L	< 5.0	< 500	< 5.0	< 5.0
cis-1,3-Dichloropropene	5.0 ug/L	< 5.0	< 500	< 5.0	< 5.0
Trichloroethene	5.0 ug/L	17.	< 500	6.6	< 5.0
Dibromochloromethane	5.0 ug/L	< 5.0	< 500	< 5.0	< 5.0
1,1,2-Trichloroethane	5.0 ug/L	< 5.0	< 500	< 5.0	< 5.0
Benzene	5.0 ug/L	< 5.0	16000	< 5.0	< 5.0
2-Chloroethyl vinyl ether	10. ug/L	< 10.	< 1000	< 10.	< 10.
trans-1,3-Dichloropropene	5.0 ug/L	< 5.0	< 500	< 5.0	< 5.0
Bromoform	5.0 ug/L	< 5.0	< 500	< 5.0	< 5.0
4-Methyl-2-pentanone	20. ug/L	< 20.	< 2000	< 20.	< 20.
2-Hexanone	20. ug/L	< 20.	< 2000	< 20.	< 20.
Tetrachloroethene	5.0 ug/L	15.	< 500	27.	10.
1,1,2,2-Tetrachloroethane	5.0 ug/L	< 5.0	< 500	< 5.0	< 5.0
Toluene	5.0 ug/L	< 5.0	17000	< 5.0	< 5.0
Chlorobenzene	5.0 ug/L	< 5.0	< 500	< 5.0	< 5.0
Ethylbenzene	5.0 ug/L	< 5.0	3300	< 5.0	< 5.0
Styrene	5.0 ug/L	< 5.0	< 500	< 5.0	< 5.0
Xylenes (total)	5.0 ug/L	< 5.0	17000	< 5.0	< 5.0
1,3-Dichlorobenzene	10. ug/L	< 10.	< 1000	< 10.	< 10.
1,4-Dichlorobenzene	10. ug/L	< 10.	< 1000	< 10.	< 10.
1,2-Dichlorobenzene	10. ug/L	< 10.	< 1000	< 10.	< 10.

Notes:
NEI/GTEL Tampa, FL
F7100092:3

NEI/GTEL Client ID: 100212
Login Number: F7100092
Project ID (number): 100212
Project ID (name): TEXACO TUTU

ANALYTICAL RESULTS

Volatile Organics
Method: EPA 8240
Matrix: NotPres AQ

NEI/GTEL Sample Number	F7100092-05	F7100092-06	F7100092-07	F7100092-08
Client ID	TT-5	TT-1	TT-2	MW-4
Date Sampled	10/07/97	10/07/97	10/07/97	10/07/97
Date Analyzed	10/17/97	10/17/97	10/17/97	10/17/97
Dilution Factor	1.00	100	1.00	1.00

Analyte	Reporting Limit	Units	Concentration:

Notes: (continued)

Dilution Factor:
Dilution factor indicates the adjustments made for sample dilution.

EPA 8240:
"Test Methods for Evaluating Solid Waste. Physical/Chemical Methods". SW-846. Third Edition including Update I. Analyte list modified to include additional compounds.

NEI/GTEL Client ID: 100212
Login Number: F7100092
Project ID (number): 100212
Project ID (name): TEXACO TUTU

ANALYTICAL RESULTS

Volatile Organics
Method: EPA 8240
Matrix: NotPres AQ

	NEI/GTEL Sample Number:	F7100092-09	F7100092-10	F7100092-11	F7100092-12
	Client ID:	MW-4D	TRIP BLANK	DUPLICATE	TT-4/VE-1
	Date Sampled:	10/07/97	10/07/97	10/07/97	10/07/97
	Date Analyzed:	10/17/97	10/15/97	10/17/97	10/20/97
	Dilution Factor:	1.00	1.00	1.00	5.00
Analyte	Reporting Limit	Units	Concentration:			
Chloromethane	10.	ug/L	< 10.	< 10.	< 10.	< 50.
Bromomethane	10.	ug/L	< 10.	< 10.	< 10.	< 50.
Vinyl chloride	10.	ug/L	< 10.	< 10.	< 10.	< 50.
Chloroethane	10.	ug/L	< 10.	< 10.	< 10.	< 50.
Methylene chloride	5.0	ug/L	< 5.0	< 5.0	< 5.0	< 25.
Acetone	20.	ug/L	< 20.	< 20.	< 20.	< 100
Carbon disulfide	5.0	ug/L	< 5.0	< 5.0	< 5.0	< 25.
1,1-Dichloroethene	5.0	ug/L	< 5.0	< 5.0	< 5.0	< 25.
1,1-Dichloroethane	5.0	ug/L	< 5.0	< 5.0	< 5.0	< 25.
1,2-Dichloroethene (total)	5.0	ug/L	18.	< 5.0	27.	< 25.
Chloroform	5.0	ug/L	< 5.0	< 5.0	< 5.0	< 25.
1,2-Dichloroethane	5.0	ug/L	< 5.0	< 5.0	< 5.0	< 25.
2-Butanone	20.	ug/L	< 20.	< 20.	< 20.	< 100
1,1,1-Trichloroethane	5.0	ug/L	< 5.0	< 5.0	< 5.0	< 25.
Carbon tetrachloride	5.0	ug/L	< 5.0	< 5.0	< 5.0	< 25.
Vinyl acetate	20.	ug/L	< 20.	< 20.	< 20.	< 100
Bromodichloromethane	5.0	ug/L	< 5.0	< 5.0	< 5.0	< 25.
1,2-Dichloropropane	5.0	ug/L	< 5.0	< 5.0	< 5.0	< 25.
cis-1,3-Dichloropropene	5.0	ug/L	< 5.0	< 5.0	< 5.0	< 25.
Trichloroethene	5.0	ug/L	< 5.0	< 5.0	< 5.0	< 25.
Dibromochloromethane	5.0	ug/L	< 5.0	< 5.0	< 5.0	< 25.
1,1,2-Trichloroethane	5.0	ug/L	< 5.0	< 5.0	< 5.0	< 25.
Benzene	5.0	ug/L	< 5.0	< 5.0	< 5.0	2400
2-Chloroethyl vinyl ether	10.	ug/L	< 10.	< 10.	< 10.	< 50.
trans-1,3-Dichloropropene	5.0	ug/L	< 5.0	< 5.0	< 5.0	< 25.
Bromoform	5.0	ug/L	< 5.0	< 5.0	< 5.0	< 25.
4-Methyl-2-pentanone	20.	ug/L	< 20.	< 20.	< 20.	< 100
2-Hexanone	20.	ug/L	< 20.	< 20.	< 20.	< 100
Tetrachloroethene	5.0	ug/L	5.1	< 5.0	11.	< 25.
1,1,2,2-Tetrachloroethane	5.0	ug/L	< 5.0	< 5.0	< 5.0	< 25.
Toluene	5.0	ug/L	< 5.0	< 5.0	< 5.0	51.
Chlorobenzene	5.0	ug/L	< 5.0	< 5.0	< 5.0	< 25.
Ethylbenzene	5.0	ug/L	< 5.0	< 5.0	< 5.0	700
Styrene	5.0	ug/L	< 5.0	< 5.0	< 5.0	< 25.
Xylenes (total)	5.0	ug/L	< 5.0	< 5.0	< 5.0	460
1,3-Dichlorobenzene	10.	ug/L	< 10.	< 10.	< 10.	< 50.
1,4-Dichlorobenzene	10.	ug/L	< 10.	< 10.	< 10.	< 50.
1,2-Dichlorobenzene	10.	ug/L	< 10.	< 10.	< 10.	< 50.

Notes:
NEI/GTEL Tampa, FL
F7100092:5

NEI/GTEL Client ID: 100212
Login Number: F7100092
Project ID (number): 100212
Project ID (name): TEXACO TUTU

ANALYTICAL RESULTS

Volatile Organics
Method: EPA 8240
Matrix: NotPres AQ

NEI/GTEL Sample Number:	F7100092-09	F7100092-10	F7100092-11	F7100092-12
Client ID:	MW-4D	TRIP BLANK	DUPLICATE	IT-4/VE-1
Date Sampled:	10/07/97	10/07/97	10/07/97	10/07/97
Date Analyzed:	10/17/97	10/15/97	10/17/97	10/20/97
Dilution Factor:	1.00	1.00	1.00	5.00

Analyte	Reporting Limit	Units	Concentration:

Notes: (continued)

Dilution Factor:
Dilution factor indicates the adjustments made for sample dilution.

EPA 8240:
"Test Methods for Evaluating Solid Waste. Physical/Chemical Methods". SW-846. Third Edition including Update I. Analyte list modified to include additional compounds.

NEI/GTEL Client ID: 100212
Login Number: F7100092
Project ID (number): 100212
Project ID (name): TEXACO TUTU

ANALYTICAL RESULTS

Volatile Organics
Method: EPA 8240
Matrix: NotPres AQ

	NEI/GTEL Sample Number	F7100092-13	F7100092-14	F7100092-15	F7100092-16
	Client ID	MW-1	MW-10	MW-16	TRIP BLANK
	Date Sampled	10/08/97	10/08/97	10/08/97	10/08/97
	Date Analyzed	10/20/97	10/20/97	10/20/97	10/15/97
	Dilution Factor	1.00	1.00	1.00	1.00
Analyte	Reporting Limit	Units	Concentration:			
Chloromethane	10.	ug/L	< 10.	< 10.	< 10.	< 10.
Bromomethane	10.	ug/L	< 10.	< 10.	< 10.	< 10.
Vinyl chloride	10.	ug/L	< 10.	27.	77.	< 10.
Chloroethane	10.	ug/L	< 10.	< 10.	< 10.	< 10.
Methylene chloride	5.0	ug/L	< 5.0	< 5.0	< 5.0	< 5.0
Acetone	20.	ug/L	< 20.	< 20.	< 20.	< 20.
Carbon disulfide	5.0	ug/L	< 5.0	< 5.0	< 5.0	< 5.0
1.1-Dichloroethene	5.0	ug/L	< 5.0	< 5.0	< 5.0	< 5.0
1.1-Dichloroethane	5.0	ug/L	< 5.0	< 5.0	< 5.0	< 5.0
1.2-Dichloroethene (total)	5.0	ug/L	310	540	2900	< 5.0
Chloroform	5.0	ug/L	< 5.0	< 5.0	< 5.0	< 5.0
1.2-Dichloroethane	5.0	ug/L	< 5.0	< 5.0	< 5.0	< 5.0
2-Butanone	20.	ug/L	< 20.	< 20.	< 20.	< 20.
1.1.1-Trichloroethane	5.0	ug/L	< 5.0	< 5.0	< 5.0	< 5.0
Carbon tetrachloride	5.0	ug/L	< 5.0	< 5.0	< 5.0	< 5.0
Vinyl acetate	20.	ug/L	< 20.	< 20.	< 20.	< 20.
Bromodichloromethane	5.0	ug/L	< 5.0	< 5.0	< 5.0	< 5.0
1.2-Dichloropropane	5.0	ug/L	< 5.0	< 5.0	< 5.0	< 5.0
cis-1.3-Dichloropropene	5.0	ug/L	< 5.0	< 5.0	< 5.0	< 5.0
Trichloroethene	5.0	ug/L	47.	54.	200	< 5.0
Dibromochloromethane	5.0	ug/L	< 5.0	< 5.0	< 5.0	< 5.0
1.1.2-Trichloroethane	5.0	ug/L	< 5.0	< 5.0	< 5.0	< 5.0
Benzene	5.0	ug/L	< 5.0	< 5.0	< 5.0	< 5.0
2-Chloroethyl vinyl ether	10.	ug/L	< 10.	< 10.	< 10.	< 10.
trans-1.3-Dichloropropene	5.0	ug/L	< 5.0	< 5.0	< 5.0	< 5.0
Bromoform	5.0	ug/L	< 5.0	< 5.0	< 5.0	< 5.0
4-Methyl-2-pentanone	20.	ug/L	< 20.	< 20.	< 20.	< 20.
2-Hexanone	20.	ug/L	< 20.	< 20.	< 20.	< 20.
Tetrachloroethene	5.0	ug/L	300	200	190	< 5.0
1.1.2.2-Tetrachloroethane	5.0	ug/L	< 5.0	< 5.0	< 5.0	< 5.0
Toluene	5.0	ug/L	< 5.0	< 5.0	< 5.0	< 5.0
Chlorobenzene	5.0	ug/L	< 5.0	< 5.0	< 5.0	< 5.0
Ethylbenzene	5.0	ug/L	< 5.0	< 5.0	< 5.0	< 5.0
Styrene	5.0	ug/L	< 5.0	< 5.0	< 5.0	< 5.0
Xylenes (total)	5.0	ug/L	< 5.0	< 5.0	< 5.0	< 5.0
1.3-Dichlorobenzene	10.	ug/L	< 10.	< 10.	< 10.	< 10.
1.4-Dichlorobenzene	10.	ug/L	< 10.	< 10.	< 10.	< 10.
1.2-Dichlorobenzene	10.	ug/L	< 10.	< 10.	< 10.	< 10.

Notes:
NEI/GTEL Tampa, FL
F7100092:7

NEI/GTEL Client ID: 100212
Login Number: F7100092
Project ID (number): 100212
Project ID (name): TEXACO TUTU

ANALYTICAL RESULTS

Volatile Organics
Method: EPA 8240
Matrix: NotPres AQ

NEI/GTEL Sample Number	F7100092-13	F7100092-14	F7100092-15	F7100092-16
Client ID	MW-1L	MW-1B	MW-1G	TRIP BLANK
Date Sampled	10/08/97	10/08/97	10/08/97	10/08/97
Date Analyzed	10/20/97	10/20/97	10/20/97	10/15/97
Dilution Factor	1.00	1.00	1.00	1.00

Analyte	Reporting Limit	Units	Concentration:

Notes: (continued)

Dilution Factor:
Dilution factor indicates the adjustments made for sample dilution.

EPA 8240:
"Test Methods for Evaluating Solid Waste. Physical/Chemical Methods". SW-846. Third Edition including Update 1. Analyte list modified to include additional compounds.

NEI/GTEL Client ID: 100212
Login Number: F7100092
Project ID (number): 100212
Project ID (name): TEXACO TUTU

ANALYTICAL RESULTS

Volatile Organics
Method: EPA 8240
Matrix: NotPres AQ

NEI/GTEL Sample Number	F7100092-17	--	--	--
Client ID	DUPLICATE	--	--	--
Date Sampled	10/08/97	--	--	--
Date Analyzed	10/20/97	--	--	--
Dilution Factor	1.00	--	--	--

Analyte	Reporting Limit	Units	Concentration:			
Chloromethane	10.	ug/L	< 10.	--	--	--
Bromomethane	10.	ug/L	< 10.	--	--	--
Vinyl chloride	10.	ug/L	89.	--	--	--
Chloroethane	10.	ug/L	< 10.	--	--	--
Methylene chloride	5.0	ug/L	< 5.0	--	--	--
Acetone	20.	ug/L	< 20.	--	--	--
Carbon disulfide	5.0	ug/L	< 5.0	--	--	--
1,1-Dichloroethene	5.0	ug/L	< 5.0	--	--	--
1,1-Dichloroethane	5.0	ug/L	< 5.0	--	--	--
1,2-Dichloroethene (total)	5.0	ug/L	2600	--	--	--
Chloroform	5.0	ug/L	< 5.0	--	--	--
1,2-Dichloroethane	5.0	ug/L	< 5.0	--	--	--
2-Butanone	20.	ug/L	< 20.	--	--	--
1,1,1-Trichloroethane	5.0	ug/L	< 5.0	--	--	--
Carbon tetrachloride	5.0	ug/L	< 5.0	--	--	--
Vinyl acetate	20.	ug/L	< 20.	--	--	--
Bromodichloromethane	5.0	ug/L	< 5.0	--	--	--
1,2-Dichloropropane	5.0	ug/L	< 5.0	--	--	--
cis-1,3-Dichloropropene	5.0	ug/L	< 5.0	--	--	--
Trichloroethene	5.0	ug/L	170	--	--	--
Dibromochloromethane	5.0	ug/L	< 5.0	--	--	--
1,1,2-Trichloroethane	5.0	ug/L	< 5.0	--	--	--
Benzene	5.0	ug/L	< 5.0	--	--	--
2-Chloroethyl vinyl ether	10.	ug/L	< 10.	--	--	--
trans-1,3-Dichloropropene	5.0	ug/L	< 5.0	--	--	--
Bromoform	5.0	ug/L	< 5.0	--	--	--
4-Methyl-2-pentanone	20.	ug/L	< 20.	--	--	--
2-Hexanone	20.	ug/L	< 20.	--	--	--
Tetrachloroethene	5.0	ug/L	160	--	--	--
1,1,2,2-Tetrachloroethane	5.0	ug/L	< 5.0	--	--	--
Toluene	5.0	ug/L	< 5.0	--	--	--
Chlorobenzene	5.0	ug/L	< 5.0	--	--	--
Ethylbenzene	5.0	ug/L	< 5.0	--	--	--
Styrene	5.0	ug/L	< 5.0	--	--	--
Xylenes (total)	5.0	ug/L	< 5.0	--	--	--
1,3-Dichlorobenzene	10.	ug/L	< 10.	--	--	--
1,4-Dichlorobenzene	10.	ug/L	< 10.	--	--	--
1,2-Dichlorobenzene	10.	ug/L	< 10.	--	--	--

Notes:
NEI/GTEL Tampa, FL
F7100092:9

NEI/GTEL Client ID: 100212
Login Number: F7100092
Project ID (number): 100212
Project ID (name): TEXACO TUTU

ANALYTICAL RESULTS

Volatile Organics
Method: EPA 8240
Matrix: NotPres AQ

NEI/GTEL Sample Number	F7100092-14			
Client ID	DUPLICATE			
Date Sampled	10/08/97			
Date Analyzed	10/20/97			
Dilution Factor	1.00			

Analyte	Reporting Limit	Units	Concentration:

Notes: (continued)

lution Factor:
Dilution factor indicates the adjustments made for sample dilution.

PA 8240:
"Test Methods for Evaluating Solid Waste. Physical/Chemical Methods". SW-846. Third Edition including Update 1. Analyte list modified to include additional compounds.

NEI/GTEL
ENVIRONMENTAL LABORATORIES, INC.
10500 UNIVERSITY CENTER DRIVE
TAMPA, FL 33612
(813) 979-9092

CHAIN-OF-CUSTODY RECORD AND ANALYSIS REQUEST

№ 42096

Company Name: Fluor Daniel GTI
Phone #: 954-985-1098
FAX #:
Company Address: 5553 Ravenswood Rd
Site Location: TUTU, U.S.V.I.
Project Manager: Dale McFarland
Client Project ID: (#) 100212
(NAME) Texaco Tutu
I attest that the proper field sampling procedures were used during the collection of these samples.
Sampler Name (Print): John Henriquez

ANALYSIS REQUEST: BTEX 602 ☐ 8020 ☐ with MTBE ☐; BTEX/Gas Hydrocarbons PID/FID ☐ with MTBE ☐; Hydrocarbons GC/FID Gas ☐ Diesel ☐ Screen ☐; Hydrocarbon Profile (SIMDIS) ☐; Oil and Grease 413.1 ☐ 413.2 ☐ SM-503 ☐; TPH/IR 418.1 ☐ SM 503 ☐; EDB by 504 ☐ DBCP by 504 ☐; EPA 524.2 ☐ 503.1 ☐ EPA 502.2 ☐; EPA 601 ☐ EPA 8010 ☐; EPA 602 ☐ EPA 8020 ☐; EPA 608 ☐ 8080 ☐ PCB only ☐; EPA 624/PPL ☐ 8240/TAL ☐ NBS (+15) ☐ 8260 ☐; EPA 625/PPL ☐ 8270/TAL ☐ NBS (+25) ☐; EPA 610 ☐ 8310 ☐; EP TOX Metals ☐ Pesticides ☐ Herbicides ☐; TCLP Metals ☐ VOA ☐ Semi-VOA ☐ Pest ☐ Herb ☐; EPA Metals - Priority Pollutant ☐ TAL ☐ RCRA ☐; CAM Metals TTLC ☐ STLC ☐; Lead 239.2 ☐ 200.7 ☐ 7420 ☐ 7421 ☐ 6010 ☐; Organic Lead ☐; Corrosivity ☐ Flash Point ☐ Reactivity ☐

OTHER: 8240 EPA; Total Hardness/Alkalinity/CaCO3

Field Sample ID	GTEL Lab # (Lab Use only)	# Containers	Matrix: Water	Method Preserved: Ice	Sampling Date	Sampling Time	8240 EPA	Total Hardness/Alkalinity/CaCO3
TT-6		3	✓	3	10-7-97	10:00	3	
MW-5		3	↓	↓	10-7-97	10:50	3	
MW-3		3	↓	↓	10-7-97	11:00	3	
TT-3D		3	↓	↓	10-7-97	11:30	3	
TT-5		3	↓	↓	10-7-97	12:00	3	
TT-1		4	↓	↓	10-7-97	12:30	3	1
TT-2		3	↓	↓	10-7-97	13:00	3	
MW-4		3	↓	↓	10-7-97	13:30	3	
MW-4D		3	↓	↓	10-7-97	14:00	3	
Trip-Blank		2	↓	↓	10-7-97	14:40	2	
Duplicate		3	↓	↓	10-7-97	—	3	

TAT
Priority (24 hr) ☐
Expedited (48 hr) ☐
7 Business Days ☐
Other ______ Business Days ☐

Special Handling
GTEL Contact ______
Quote/Contract # ______
Confirmation # ______
P.O. # ______

QA/QC Level
Blue ☐ CLP ☐ Other ☐ ______

SPECIAL DETECTION LIMITS

SPECIAL REPORTING REQUIREMENTS
FAX ☐

REMARKS:

Lab Use Only Lot #: Storage Location
Work Order #: F710092 3°C

CUSTODY RECORD

		Date	Time	
Relinquished by Sampler: [signature]		10-8-97	12:50	Received by:
Relinquished by:		Date	Time	Received by:
Relinquished by:		10/9/97	9:30	Received by Laboratory: [signature] Waybill #

NEI/GTEL ENVIRONMENTAL LABORATORIES, INC.

10500 UNIVERSITY CENTER DRIVE
TAMPA, FL 33612
(813) 979-9092

CHAIN-OF-CUSTODY RECORD AND ANALYSIS REQUEST

No. 42095

Company Name: Flour Daniel GTI	Phone #: 954-985-1008
	FAX #:
Company Address: 5553 Ravenswood Rd	Site Location: Tutu, U.S.V.I.
Project Manager: Dale McFarland	Client Project ID: (#) 100212
	(NAME) Texaco Tutu
I attest that the proper field sampling procedures were used during the collection of these samples.	Sampler Name (Print): John Henriquez

Field Sample ID	GTEL Lab # (Lab Use only)	# CONTAINERS	Matrix: WATER	SOIL	AIR	SLUDGE	PRODUCT	OTHER	Method Preserved: HCl	HNO_3	H_2SO_4	ICE	UNPRESERVED	OTHER (Specify)	Sampling: DATE	TIME
TT-4/UE-1		3	✓												10/7/92	14:30
MW-1		3	↓												10-8-92	10:30
MW-1D		3	↓												10-8-92	10:45
MW-16		3	↓												10-8-92	11:00
Trip Blank		2	↓												10-8-92	10:15
Duplicate		2	↓												10-8-92	—

ANALYSIS REQUEST

Field Sample ID	BTEX 602 ☐ 8020 ☐ with MTBE ☐	BTEX/Gas Hydrocarbons PID/FID ☐ with MTBE ☐	Hydrocarbons GC/FID Gas ☐ Diesel ☐ Screen ☐	Hydrocarbon Profile (SIMDIS) ☐	Oil and Grease 413.1 ☐ 413.2 ☐ SM-503 ☐	TPH/IR 418.1 ☐ SM 503 ☐	EDB by 504 ☐ DBCP by 504 ☐	EPA 524.2 ☐ 503.1 ☐ EPA 502.2 ☐	EPA 601 ☐ EPA 8010 ☐	EPA 602 ☐ EPA 8020 ☐	EPA 608 ☐ 8080 ☐ PCB only ☐	EPA 624/PPL ☐ 8240/TAL ☐ NBS (+15) ☐ 8260 ☐	EPA 625/PPL ☐ 8270/TAL ☐ NBS (+25) ☐	EPA 610 ☐ 8310 ☐	EP TOX Metals ☐ Pesticides ☐ Herbicides ☐	TCLP Metals ☐ VOA ☐ Semi-VOA ☐ Pest ☐ Herb ☐	EPA Metals - Priority Pollutant ☐ TAL ☐ RCRA ☐	CAM Metals TTLC ☐ STLC ☐	Lead 239.2 ☐ 200.7 ☐ 7420 ☐ 7421 ☐ 6010 ☐	Organic Lead ☐	Corrosivity ☐ Flash Point ☐ Reactivity ☐	OTHER: 8240 EPA			
TT-4/UE-1																					3			
MW-1																					3			
MW-1D																					3			
MW-16																					3			
Trip Blank																					2			
Duplicate																					2			

TAT
- Priority (24 hr) ☐
- Expedited (48 hr) ☐
- 7 Business Days ☐
- Other ______ Business Days ☐

Special Handling
- GTEL Contact ______
- Quote/Contract # ______
- Confirmation # ______
- P.O. # ______

QA/QC Level
Blue ☐ CLP ☐ Other ☐ ______

SPECIAL DETECTION LIMITS

REMARKS:

SPECIAL REPORTING REQUIREMENTS

FAX ☐

Lab Use Only Lot #: Storage Location

Work Order #: [illegible] 2 7/10 92

CUSTODY RECORD		Date	Time	
	Relinquished by Sampler: [signature]			Received by:
	Relinquished by:			Received by:
	Relinquished by:	10/10/92	9 [illegible]	Received by Laboratory: [signature] Waybill #

NEI/GTEL Client ID: 100212
Login Number: F7100092
Project ID (number): 100212
Project ID (name): TEXACO TUTU

QUALITY CONTROL RESULTS

Volatile Organics
Method: EPA 8240
Matrix: NotPres AQ

Conformance/Non-Conformance Summary

(X = Requirements Met * = See Comments -- = Not Required)

Conformance Item	Volatile Organics	Semi-Volatile Organics	Inorganics (MT, OG, WC)
GC/MS Tune	--	--	--
Initial Calibration	X	--	--
Continuing Calibration	X	--	--
Surrogate Recovery	X	--	--
Holding Time	*	--	--
Method Accuracy	X	--	--
Method Precision	X	--	--
Blank Contamination	X	--	--

Comments:

NEI/GTEL Client ID:
Login Number: 101497I1
Project ID (number):
Project ID (name):

QUALITY CONTROL RESULTS

Volatile Organics
Method: EPA 8240
Matrix: NotPres AQ

VOA GC/MS Tune Report

Analyte			% Relative Abundance	Acceptability Limits Recovery
EPA 8240	Units:%	QC Batch:101497I1-1		
Target Mass 50			18.3	15- 40%
Target Mass 75			41.6	30- 60%
Target Mass 95			100.	100-100%
Target Mass 96			6.60	5- 9%
Target Mass 173			0.00	0- 2%
Target Mass 174			84.0	50-100%
Target Mass 175			7.20	5- 9%
Target Mass 176			98.8	95-101%
Target Mass 177			6.70	5- 9%

Notes:

NEI/GTEL Client ID: 100212
Login Number: F7100092
Project ID (number): 100212
Project ID (name): TEXACO TUTU

QUALITY CONTROL RESULTS

Volatile Organics
Method: EPA 8240
Matrix: NotPres AQ

Initial Calibration Verification Sample Summary

Analyte	Spike Amount	Check Sample Concentration	QC Percent Recovery	Acceptability Limits Recovery
EPA 8240 Units:ug/l	QC Batch:101797I-6			
Chloromethane	50.0	53.3	107.	50-204%
Vinyl chloride	50.0	54.6	109.	4-196%
Bromomethane	50.0	49.6	99.2	14-186%
Chloroethane	50.0	53.2	106.	14-230%
1,1-Dichloroethene	50.0	50.3	101.	50.5-149.5%
Methylene chloride	50.0	50.5	101.	60.5-139.5%
1,1-Dichloroethane	50.0	47.0	94.0	72.5-127.5%
Chloroform	50.0	47.2	94.4	67.5-132.5%
1,1,1-Trichloroethane	50.0	47.5	95.0	75-125%
Carbon tetrachloride	50.0	47.8	95.6	73-127%
Benzene	50.0	49.2	98.4	64-136%
1,2-Dichloroethane	50.0	46.5	93.0	68-132%
Trichloroethene	50.0	46.7	93.4	66.5-133.5%
1,2-Dichloropropane	50.0	46.3	92.6	34-166%
Bromodichloromethane	50.0	48.2	96.4	65.5-134.5%
cis-1,3-Dichloropropene	50.0	48.1	96.2	70-130%
Toluene	50.0	48.9	97.8	74.5-125.5%
trans-1,3-Dichloropropene	50.0	48.3	96.6	70-130%
1,1,2-Trichloroethane	50.0	48.4	96.8	71-129%
Tetrachloroethene	50.0	46.5	93.0	73.5-126.5%
Dibromochloromethane	50.0	48.5	97.0	67.5-132.5%
Chlorobenzene	50.0	49.4	98.8	66-134%
Ethylbenzene	50.0	49.8	99.6	59-141%
Xylenes (Total)	150.	148.	98.7	75-165%
Styrene	50.0	50.4	101.	40-160%
1,3-Dichlorobenzene	50.0	49.1	98.2	73-127%
Bromoform	50.0	51.3	103.	45-169%
1,4-Dichlorobenzene	50.0	49.0	98.0	63-137%
1,2-Dichlorobenzene	50.0	49.1	98.2	63-137%
1,1,2,2-Tetrachloroethane	50.0	47.5	95.0	60.5-139.5%

Notes:

NEI/GTEL Client ID: 100212
Login Number: F7100092
Project ID (number): 100212
Project ID (name): TEXACO TUTU

QUALITY CONTROL RESULTS

Volatile Organics
Method: EPA 8240
Matrix: NotPres AQ

Calibration Verification Sample Summary

Analyte	Spike Amount	Check Sample Concentration	QC Percent Recovery	Acceptability Limits Recovery
EPA 8240 Units:ug/l	**QC Batch:10149711-2**			
Chloromethane	50.0	41.5	83.0	.1-204%
Vinyl chloride	50.0	49.6	99.2	4-196%
Bromomethane	50.0	48.2	96.4	14-186%
Chloroethane	50.0	55.8	112.	38-162%
1,1-Dichloroethene	50.0	58.5	117.	50.5-149.5%
Methylene chloride	50.0	53.1	106.	60.5-139.5%
1,1-Dichloroethane	50.0	53.8	108.	72.5-127.5%
Chloroform	50.0	53.9	108.	67.5-132.5%
1,1,1-Trichloroethane	50.0	56.1	112.	75-125%
Carbon tetrachloride	50.0	57.1	114.	73-127%
Benzene	50.0	53.8	108.	64-136%
1,2-Dichloroethane	50.0	53.5	107.	68-132%
Trichloroethene	50.0	56.2	112.	66.5-133.5%
1,2-Dichloropropane	50.0	53.4	107.	34-166%
Bromodichloromethane	50.0	55.4	111.	65.5-134.5%
cis-1,3-Dichloropropene	50.0	55.2	110.	24-176%
Toluene	50.0	55.0	110.	74.5-125.5%
trans-1,3-Dichloropropene	50.0	54.8	110.	50-150%
1,1,2-Trichloroethane	50.0	49.6	99.2	71-129%
Tetrachloroethene	50.0	57.6	115.	73.5-126.5%
Dibromochloromethane	50.0	55.0	110.	67.5-132.5%
Chlorobenzene	50.0	55.1	110.	66-134%
Ethylbenzene	50.0	56.8	114.	59-141%
Xylenes (Total)	150.	169.	113.	75-125%
1,3-Dichlorobenzene	50.0	54.7	109.	73-127%
Styrene	50.0	53.8	108.	75-125%
1,4-Dichlorobenzene	50.0	55.1	110.	63-137%
Bromoform	50.0	56.1	112.	71-129%
1,2-Dichlorobenzene	50.0	52.5	105.	63-137%
1,1,2,2-Tetrachloroethane	50.0	52.5	105.	60.5-139.5%
EPA 8240 Units:ug/l	**QC Batch:101597I-2**			
Chloromethane	50.0	31.1	62.2	.1-204%
Vinyl chloride	50.0	40.7	81.4	4-196%
Bromomethane	50.0	38.1	76.2	14-186%
Chloroethane	50.0	46.4	92.8	38-162%
1,1-Dichloroethene	50.0	53.5	107.	50.5-149.5%
Methylene chloride	50.0	47.9	95.8	60.5-139.5%
1,1-Dichloroethane	50.0	48.9	97.8	72.5-127.5%
Chloroform	50.0	50.7	101.	67.5-132.5%
1,1,1-Trichloroethane	50.0	53.0	106.	75-125%
Carbon tetrachloride	50.0	53.5	107.	73-127%
Benzene	50.0	50.9	102.	64-136%
1,2-Dichloroethane	50.0	48.4	96.8	68-132%

NEI/GTEL Client ID: 100212
Login Number: F7100092
Project ID (number): 100212
Project ID (name): TEXACO TUTU

QUALITY CONTROL RESULTS

Volatile Organics
Method: EPA 8240
Matrix: NotPres AQ

Calibration Verification Sample Summary

Analyte	Spike Amount	Check Sample Concentration	QC Percent Recovery	Acceptability Limits Recovery
Trichloroethene	50.0	56.7	113.	66.5-133.5%
1,2-Dichloropropane	50.0	49.9	99.8	34-166%
Bromodichloromethane	50.0	53.5	107.	65.5-134.5%
cis-1,3-Dichloropropene	50.0	52.0	104.	24-176%
Toluene	50.0	53.5	107.	74.5-125.5%
trans-1,3-Dichloropropene	50.0	51.9	104.	50-150%
1,1,2-Trichloroethane	50.0	47.7	95.4	71-129%
Tetrachloroethene	50.0	59.4	119.	73.5-126.5%
Dibromochloromethane	50.0	54.7	109.	67.5-132.5%
Chlorobenzene	50.0	53.9	108.	66-134%
Ethylbenzene	50.0	54.8	110.	59-141%
Xylenes (Total)	150.	164.	109.	75-125%
1,3-Dichlorobenzene	50.0	55.5	111.	73-127%
Styrene	50.0	52.9	106.	75-125%
1,4-Dichlorobenzene	50.0	55.4	111.	63-137%
Bromoform	50.0	58.5	117.	71-129%
1,2-Dichlorobenzene	50.0	54.2	108.	63-137%
1,1,2,2-Tetrachloroethane	50.0	50.2	100.	60.5-139.5%
EPA 8240 Units:ug/l	**QC Batch:101797I-2**			
Chloromethane	50.0	50.6	101.	.1-204%
Vinyl chloride	50.0	52.9	106.	4-196%
Bromomethane	50.0	53.6	107.	14-186%
Chloroethane	50.0	53.0	106.	38-162%
1,1-Dichloroethene	50.0	52.8	106.	50.5-149.5%
Methylene chloride	50.0	46.8	93.6	60.5-139.5%
1,1-Dichloroethane	50.0	51.6	103.	72.5-127.5%
Chloroform	50.0	51.0	102.	67.5-132.5%
1,1,1-Trichloroethane	50.0	53.9	108.	75-125%
Carbon tetrachloride	50.0	54.1	108.	73-127%
Benzene	50.0	51.6	103.	64-136%
1,2-Dichloroethane	50.0	50.0	100.	68-132%
Trichloroethene	50.0	55.2	110.	66.5-133.5%
1,2-Dichloropropane	50.0	51.8	104.	34-166%
Bromodichloromethane	50.0	53.7	107.	65.5-134.5%
cis-1,3-Dichloropropene	50.0	52.3	105.	24-176%
Toluene	50.0	54.4	109.	74.5-125.5%
trans-1,3-Dichloropropene	50.0	52.2	104.	50-150%
1,1,2-Trichloroethane	50.0	49.9	99.8	71-129%
Tetrachloroethene	50.0	56.9	114.	73.5-126.5%
Dibromochloromethane	50.0	55.7	111.	67.5-132.5%
Chlorobenzene	50.0	54.0	108.	66-134%
Ethylbenzene	50.0	55.3	111.	59-141%
Xylenes (Total)	150.	165.	110.	75-125%
1,3-Dichlorobenzene	50.0	53.0	106.	73-127%

NEI/GTEL Client ID: 100212 QUALITY CONTROL RESULTS
Login Number: F7100092 Volatile Organics
Project ID (number): 100212 Method: EPA 8240
Project ID (name): TEXACO TUTU Matrix: NotPres AQ

Calibration Verification Sample Summary

Analyte	Spike Amount	Check Sample Concentration	QC Percent Recovery	Acceptability Limits Recovery
Styrene	50.0	54.6	109.	75-125%
1,4-Dichlorobenzene	50.0	52.9	106.	63-137%
Bromoform	50.0	61.1	122.	71-129%
1,2-Dichlorobenzene	50.0	52.2	104.	63-137%
1,1,2,2-Tetrachloroethane	50.0	49.2	98.4	60.5-139.5%
EPA 8240 Units:ug/l QC Batch:102097I-2				
Chloromethane	50.0	46.9	93.8	1-204%
Vinyl chloride	50.0	50.1	100.	4-196%
Bromomethane	50.0	48.7	97.4	14-186%
Chloroethane	50.0	52.8	106.	38-162%
1,1-Dichloroethene	50.0	49.0	98.0	50.5-149.5%
Methylene chloride	50.0	47.7	95.4	60.5-139.5%
1,1-Dichloroethane	50.0	50.9	102.	72.5-127.5%
Chloroform	50.0	51.3	103.	67.5-132.5%
1,1,1-Trichloroethane	50.0	51.9	104.	75-125%
Carbon tetrachloride	50.0	53.7	107.	73-127%
Benzene	50.0	51.2	102.	64-136%
1,2-Dichloroethane	50.0	48.9	97.8	68-132%
Trichloroethene	50.0	57.4	115.	66.5-133.5%
1,2-Dichloropropane	50.0	51.9	104.	34-166%
Bromodichloromethane	50.0	55.4	111.	65.5-134.5%
cis-1,3-Dichloropropene	50.0	53.5	107.	24-176%
Toluene	50.0	53.3	107.	74.5-125.5%
trans-1,3-Dichloropropene	50.0	52.8	106.	50-150%
1,1,2-Trichloroethane	50.0	50.9	102.	71-129%
Tetrachloroethene	50.0	55.4	111.	73.5-126.5%
Dibromochloromethane	50.0	58.7	117.	67.5-132.5%
Chlorobenzene	50.0	54.2	108.	66-134%
Ethylbenzene	50.0	54.3	109.	59-141%
Xylenes (Total)	150.	162.	108.	75-125%
1,3-Dichlorobenzene	50.0	55.0	110.	73-127%
Styrene	50.0	54.6	109.	75-125%
1,4-Dichlorobenzene	50.0	54.6	109.	63-137%
Bromoform	50.0	57.6	115.	71-129%
1,2-Dichlorobenzene	50.0	54.8	110.	63-137%
1,1,2,2-Tetrachloroethane	50.0	51.4	103.	60.5-139.5%

Notes:

NEI/GTEL Client ID: 100212
Login Number: F7100092
Project ID (number): 100212
Project ID (name): TEXACO TUTU

QUALITY CONTROL RESULTS

Volatile Organics
Method: EPA 8240
Matrix: NotPres AQ

Surrogate Results

QC Batch No.	Reference	Sample ID	S1 (DCA)	S2 (TOL)	S3 (BFB)
Method: EPA 8240		Acceptability Limits:	76-114%	88-110%	86-115%
101497I1-2	CV101497I1A	Cal Verification	106.	101.	103.
101497I1-3	BW101497I1A	Method Blank Water	105.	101.	102.
101597I-2	CV101597A	Cal Verification	95.8	98.3	98.5
101597I-3	BW101597A	Method Blank Water	93.6	98.2	98.4
101797I-2	CV101797A	Cal Verification	97.5	100.	102.
101797I-3	BW101797A	Method Blank Water	100.	101.	101.
101797I-4	MS10009204	Matrix Spike	93.7	101.	101.
101797I-5	MD10009204	Matrix Spike Dup	96.7	99.8	102.
101797I-6	IV101797A	Independent QC Chk	98.7	101.	100.
102097I-2	CV102097A	Cal Verification	96.9	99.3	102.
102097I-3	BW102097A	Method Blank Water	92.7	98.2	100.
102097I-4	LW102097A	Lab Ctrl Water	92.3	98.7	102.
102097I-5	LWD102097A	Lab Ctrl Water Dup	92.6	99.6	103.
--	10009201	TT-6	107.	103.	105.
--	10009202	MW-5	94.7	99.4	101.
--	10009203	MW-3	113.	104.	106.
--	10009204	TT-3D	95.8	99.3	102.
--	10009205	TT-5	98.3	98.9	101.
--	10009206	TT-1	94.8	98.4	99.8
--	10009207	TT-2	95.6	98.9	98.8
--	10009208	MW-4	95.2	98.5	101.
--	10009209	MW-4D	96.5	99.0	99.9
--	10009210	TRIP BLANK	100.	95.4	99.0
--	10009211	DUPLICATE	97.7	99.3	100.
--	10009212	TT-4/VE-1	88.5	98.3	103.
--	10009213	MW-1	93.4	98.7	101.
--	10009214	MW-1D	88.7	109.	95.6
--	10009215	MW-16	92.8	98.9	100.
--	10009216	TRIP BLANK	96.5	98.0	99.7
--	10009217	DUPLICATE	94.9	98.2	99.3

Notes:
*: Indicates values outside of acceptability limits. See Nonconformance Summary.

NEI/GTEL Client ID: 100212
Login Number: F7100092
Project ID (number): 100212
Project ID (name): TEXACO TUTU

QUALITY CONTROL RESULTS

Volatile Organics
Method: EPA 8240
Matrix: NotPres AQ

Matrix Spike and Matrix Spike Duplicate Results

Analyte	Original Concentration	Spike Amount	Matrix Spike Concentration	Matrix Spike Recovery, %	Matrix Spike Duplicate Concentration	Matrix Spike Duplicate Recovery, %	RPD, %	Acceptability Limits RPD, %	Acceptability Limits Recovery, %
EPA 8240 Units: ug/l	QC Batch:101797I-4		GTEL Sample ID:F7100092-04		Client ID:TT-3D				
1,1-Dichloroethene	< 5.00	50.0	52.2	104.	52.2	104.	0.00	14	61-145%
Trichloroethene	15.0	50.0	62.7	95.4	62.7	95.4	0.00	13	76-125%
Benzene	< 5.00	50.0	50.0	100.	50.0	100.	0.00	11	76-127%
Toluene	< 5.00	50.0	52.0	104.	52.0	104.	0.00	13	76-125%
Chlorobenzene	< 5.00	50.0	51.2	102.	51.2	102.	0.00	13	75-130%

Notes:

NEI/GTEL Client ID: 100212
Login Number: F7100092
Project ID (number): 100212
Project ID (name): TEXACO TUTU

QUALITY CONTROL RESULTS

Volatile Organics
Method: EPA 8240
Matrix: NotPres AQ

Laboratory Control Sample (LCS) and Laboratory Control Duplicate Results

Analyte	Spike Amount	LCS Concentration	LCS Recovery, %	LCS Duplicate Concentration	LCS Duplicate Recovery, %	RPD, %	Acceptability Limits RPD, %	Acceptability Limits Recovery, %
EPA 8240 Units: ug/L		QC Batch:102097I-5						
1,1-Dichloroethene	50.0	48.5	97.0	48.5	97.0	0.00	14	61-145%
Trichloroethene	50.0	50.8	102.	50.8	102.	0.00	13	76-125%
Benzene	50.0	47.0	94.0	47.0	94.0	0.00	11	76-127%
Toluene	50.0	49.6	99.2	49.6	99.2	0.00	13	76-125%
Chlorobenzene	50.0	50.0	100.	50.0	100.	0.00	13	75-130%

Notes:

NEI/GTEL Client ID: 100212
Login Number: F7100092
Project ID (number): 100212
Project ID (name): TEXACO TUTU

QUALITY CONTROL RESULTS

Volatile Organics
Method: EPA 8240
Matrix: NotPres AQ

Method Blank Results

	QC Batch No:	101497I1-3	101597I-3	101797I-3	102097I-3
	Date Analyzed:	14-OCT-97	15-OCT-97	17-OCT-97	20-OCT-97
Analyte		Method: EPA 8240	Concentration: ug/L		
Chloromethane		< 10.0	< 10.0	< 10.0	< 10.0
Vinyl chloride		< 5.00	< 5.00	< 5.00	< 5.00
Bromomethane		< 10.0	< 10.0	< 10.0	< 10.0
Chloroethane		< 10.0	< 10.0	< 10.0	< 10.0
1,1-Dichloroethene		< 5.00	< 5.00	< 5.00	< 5.00
Methylene chloride		< 5.00	< 5.00	< 5.00	< 5.00
1,1-Dichloroethane		< 5.00	< 5.00	< 5.00	< 5.00
Chloroform		< 5.00	< 5.00	< 5.00	< 5.00
1,1,1-Trichloroethane		< 5.00	< 5.00	< 5.00	< 5.00
Carbon tetrachloride		< 5.00	< 5.00	< 5.00	< 5.00
Benzene		< 5.00	< 5.00	< 5.00	< 5.00
1,2-Dichloroethane		< 5.00	< 5.00	< 5.00	< 5.00
Trichloroethene		< 5.00	< 5.00	< 5.00	< 5.00
1,2-Dichloropropane		< 5.00	< 5.00	< 5.00	< 5.00
Bromodichloromethane		< 5.00	< 5.00	< 5.00	< 5.00
cis-1,3-Dichloropropene		< 5.00	< 5.00	< 5.00	< 5.00
Toluene		< 5.00	< 5.00	< 5.00	< 5.00
trans-1,3-Dichloropropene		< 5.00	< 5.00	< 5.00	< 5.00
1,1,2-Trichloroethane		< 5.00	< 5.00	< 5.00	< 5.00
Tetrachloroethene		< 5.00	< 5.00	< 5.00	< 5.00
Dibromochloromethane		< 5.00	< 5.00	< 5.00	< 5.00
Chlorobenzene		< 5.00	< 5.00	< 5.00	< 5.00
Ethylbenzene		< 5.00	< 5.00	< 5.00	< 5.00
Xylenes (Total)		< 5.00	< 5.00	< 5.00	< 5.00
1,3-Dichlorobenzene		< 5.00	< 5.00	< 5.00	< 5.00
Styrene		< 5.00	< 5.00	< 5.00	< 5.00
1,4-Dichlorobenzene		< 5.00	< 5.00	< 5.00	< 5.00
Bromoform		< 5.00	< 5.00	< 5.00	< 5.00
1,2-Dichlorobenzene		< 5.00	< 5.00	< 5.00	< 5.00
1,1,2,2-Tetrachloroethane		< 5.00	< 5.00	< 5.00	< 5.00
Acetone		< 20.0	< 20.0	< 20.0	< 20.0
Carbon disulfide		< 5.00	< 5.00	< 5.00	< 5.00
2-Butanone		< 20.0	< 20.0	< 20.0	< 20.0
Vinyl acetate		< 20.0	< 20.0	< 20.0	< 20.0
2-Chloroethyl vinyl ether		< 10.0	< 10.0	< 10.0	< 10.0
4-Methyl-2-pentanone		< 20.0	< 20.0	< 20.0	< 20.0
2-Hexanone		< 20.0	< 20.0	< 20.0	< 20.0

Notes:

NEI/GTEL
ENVIRONMENTAL LABORATORIES, INC.
Southeast Region
10500 University Center Drive, Suite 160
Tampa, FL 33612
(813) 979-9092 800-433-GTEL (4835)
FAX: 813-979-6914

December 2, 1997

Wendy Leonard
FLUOR DANIEL GTI
5553 Ravenswood Rd
Fort Lauderdale, FL 33312

RE: NEI/GTEL Client ID: 100212
Login Number: F7110284
Project ID (number): 100212
Project ID (name): TEXACO TUTU

Dear Wendy Leonard:

Enclosed please find the analytical results for the samples received by NEI/GTEL Environmental Laboratories, Inc. on 11/22/97 under Chain-of-Custody Number(s) 42088.

A formal Quality Assurance/Quality Control (QA/QC) program is maintained by NEI/GTEL, which is designed to meet or exceed the EPA requirements. Analytical work for this project met QA/QC criteria unless otherwise stated in the footnotes. This analytical report shall not be reproduced except in full.

GTEL is certified (approved) by the State of Florida under Certification Number HRS E84196, by the State of South Carolina under Certificate Number 96025, and by the State of Tennessee for UST list.

If you have any questions regarding this analysis, or if we can be of further assistance, please call our Customer Service Representative.

Sincerely,
NEI/GTEL Environmental Laboratories, Inc.

J. Peter Barto
General Manager

NEI/GTEL Client ID: 10021.2
Login Number: F7110284
Project ID (number): 10021.2
Project ID (name): TEXACO TUTU

ANALYTICAL RESULTS

Volatile Organics
Method: EPA 8240
Matrix: NotPres AQ

Analyte	Reporting Limit	Units	Concentration:			
Chloromethane	10.	ug/L	< 10.	< 10.	< 10.	--
Bromomethane	10.	ug/L	< 10.	< 10.	< 10.	--
Vinyl chloride	10.	ug/L	< 10.	< 10.	< 10.	--
Chloroethane	10.	ug/L	< 10.	< 10.	< 10.	--
Methylene chloride	5.0	ug/L	< 5.0	< 5.0	< 5.0	--
Acetone	20.	ug/L	< 20.	< 20.	< 20.	--
Carbon disulfide	5.0	ug/L	< 5.0	< 5.0	< 5.0	--
1,1-Dichloroethene	5.0	ug/L	< 5.0	< 5.0	< 5.0	--
1,1-Dichloroethane	5.0	ug/L	< 5.0	< 5.0	< 5.0	--
1,2-Dichloroethene (total)	5.0	ug/L	31.	23.	< 5.0	--
Chloroform	5.0	ug/L	< 5.0	< 5.0	< 5.0	--
1,2-Dichloroethane	5.0	ug/L	< 5.0	< 5.0	< 5.0	--
2-Butanone	20.	ug/L	< 20.	< 20.	< 20.	--
1,1,1-Trichloroethane	5.0	ug/L	< 5.0	< 5.0	< 5.0	--
Carbon tetrachloride	5.0	ug/L	< 5.0	< 5.0	< 5.0	--
Vinyl acetate	20.	ug/L	< 20.	< 20.	< 20.	--
Bromodichloromethane	5.0	ug/L	< 5.0	< 5.0	< 5.0	--
1,2-Dichloropropane	5.0	ug/L	< 5.0	< 5.0	< 5.0	--
cis-1,3-Dichloropropene	5.0	ug/L	< 5.0	< 5.0	< 5.0	--
Trichloroethene	5.0	ug/L	5.1	< 5.0	< 5.0	--
Dibromochloromethane	5.0	ug/L	< 5.0	< 5.0	< 5.0	--
1,1,2-Trichloroethane	5.0	ug/L	< 5.0	< 5.0	< 5.0	--
Benzene	5.0	ug/L	< 5.0	< 5.0	< 5.0	--
2-Chloroethyl vinyl ether	10.	ug/L	< 10.	< 10.	< 10.	--
trans-1,3-Dichloropropene	5.0	ug/L	< 5.0	< 5.0	< 5.0	--
Bromoform	5.0	ug/L	< 5.0	< 5.0	< 5.0	--
4-Methyl-2-pentanone	20.	ug/L	< 20.	< 20.	< 20.	--
2-Hexanone	20.	ug/L	< 20.	< 20.	< 20.	--
Tetrachloroethene	5.0	ug/L	36.	29.	< 5.0	--
1,1,2,2-Tetrachloroethane	5.0	ug/L	< 5.0	< 5.0	< 5.0	--
Toluene	5.0	ug/L	< 5.0	< 5.0	< 5.0	--
Chlorobenzene	5.0	ug/L	< 5.0	< 5.0	< 5.0	--
Ethylbenzene	5.0	ug/L	< 5.0	< 5.0	< 5.0	--
Styrene	5.0	ug/L	< 5.0	< 5.0	< 5.0	--
Xylenes (total)	5.0	ug/L	< 5.0	< 5.0	< 5.0	--
1,3-Dichlorobenzene	10.	ug/L	< 10.	< 10.	< 10.	--
1,4-Dichlorobenzene	10.	ug/L	< 10.	< 10.	< 10.	--
1,2-Dichlorobenzene	10.	ug/L	< 10.	< 10.	< 10.	--

Notes:
NEI/GTEL Tampa, FL
F7110284:1

NEI/GTEL Client ID: 100212
Login Number: F7110284
Project ID (number): 100212
Project ID (name): TEXACO TUTU

ANALYTICAL RESULTS

Volatiles Organics
Method: TENNESSEE
Matrix: Aqueous

Analyte	Reporting Limit	Units	Concentration:
Gasoline Range Organics	10	ug/L	1100

Notes:

Dilution Factor:

Dilution factor indicates the adjustments made for sample dilution.

TENNESSEE:

"Test Methods for Evaluating Solid Waste: Physical/Chemical Methods", SW-846. Third Edition including Update 1. Gasoline Range Hydrocarbons (TPH) quantitated by GC/FID mod. 8015 with purge and trap (5030).

NEI/GTEL CTient ID: 1002.2
Login Number: F7110284
Project ID (number): 1002.2
Project ID (name): TEXACO TUTU

ANALYTICAL RESULTS

Volatile Organics
Method: EPA 8240
Matrix: NotPres AQ

Analyte	Reporting Limit	Units	Concentration:

Notes: (continued)

Dilution Factor:
Dilution factor indicates the adjustments made for sample dilution.

EPA 8240:
"Test Methods for Evaluating Solid Waste, Physical/Chemical Methods". SW-846. Third Edition including Update 1. Analyte list modified to include additional compounds.

NEI/GTEL ENVIRONMENTAL LABORATORIES, INC.
10500 UNIVERSITY CENTER DRIVE
TAMPA, FL 33612
(813) 979-9092

CHAIN-OF-CUSTODY RECORD AND ANALYSIS REQUEST

42088

Company Name: Flour Daniel GTI
Phone #: 954-985-1008
FAX #: 954-985-0114
Company Address: 5353 Ravenswood R STE 102 Fort Lauderdale FL 33312
Site Location: TUTU STT VITELCO wells
Project Manager: Wendy Leonard
Client Project ID: (#) 100212
Sampler Name (Print): Wesley Jamison

I attest that the proper field sampling procedures were used during the collection of these samples:

Field Sample ID	GTEL Lab # (Lab Use only)	# CONTAINERS	Matrix: WATER	SOIL	AIR	SLUDGE	PRODUCT	OTHER	Method Preserved: HCl	HNO3	H2SO4	ICE	OTHER (specify)	Sampling: DATE	TIME
#1 Composite		3	✓									✓		11/20	15:39
#2 shallow well		3	✓									✓		11/20	16:04
Trip		3	✓									✓		11/20	16:40

ANALYSIS REQUEST

BTEX 602 ☐ 8020 ☐ with MTBE ☐	BTEX/Gas Hydrocarbons PID/FID ☐ with MTBE ☐	Hydrocarbons GC/FID Gas ☐ Diesel ☐ Screen ☐	Hydrocarbon Profile (SIM/DIST) ☐	Oil and Grease 413.1 ☐ 413.2 ☐ SM-503 ☐	TPH/IR 418.1 ☐ SM 503 ☐	EDB by 504 ☐ DBCP by 504 ☐	EPA 524.2 ☐ 503.1 ☐ EPA 502.2 ☐	EPA 601 ☐ EPA 8010 ☐	EPA 602 ☐ EPA 8020 ☐	EPA 608 ☐ 8080 ☐ PCB only ☐	EPA 624/PPL ☐ 8240/TAL ☐ NES (+15) ☐ 8260 ☐	EPA 625/PPL ☐ 8270/TAL ☐ NES (+25) ☐	EPA 610 ☐ 8310 ☐	EP TOX Metals ☐ Pesticides ☐ herbicides ☐	TCLP Metals ☐ VOA ☐ Semi-VOA ☐ Pest ☐ Herb ☐	EPA Metals - Priority Pollutant ☐ TAL ☐ RCRA ☐	CAM Metals TTLC ☐ STLC ☐	Lead 239.2 ☐ 200.7 ☐ 7420 ☐ 7421 ☐ 6010 ☐	Organic Lead ☐	Corrosivity ☐ Flash Point ☐ Reactivity ☐	OTHER: GRO
											✓										
											✓										
											✓										

TAT
Priority (24 hr) ☐
Expedited (48 hr) ☐
7 Business Days ☐
Other _____
Business Days ☐

Special Handling
GTEL Contact _____
Quote/Contract # _____
Confirmation # _____
P.O. # _____

QA/QC Level
Blue ☐ CLP ☐ Other ☐ _____

SPECIAL DETECTION LIMITS

SPECIAL REPORTING REQUIREMENTS
FAX ☐

REMARKS:

Lab Use Only Lot #: Storage Location

Work Order #: F7110284

CUSTODY RECORD

	Relinquished by Sampler:	Date	Time	Received by:
1	Wesley Jamison	11/20/97	17:00	
2	Relinquished by:	Date	Time	Received by:
3	Relinquished by:	11/22/97	1120	Received by Laboratory:

12/03/97 17:42 954 985 0114 FLUOR DANIEL GTI
12/03/97 15:17 813 979 6914 GTEL ENV LAB → FDGTI FT LAUDER. 005/005

Tutu Service Station
St. Thomas, USVI
Fluor Daniel GTI Project #100212

SUMMARY OF FIELD ACTIVITIES

September 29, 1997

- Fluor Daniel GTI's technician, John Henriquez, checked in with the Texaco Tutu Service Station manager and discussed the work scope scheduled for the following week. John subsequently performed a site inspection to locate the wells scheduled for groundwater sampling.

October 6, 1997

- Fluor Daniel GTI's technicians John Henriquez and Ryan Palmer met with Rob Schriener of Aqua Design to discuss the groundwater sampling work scope. Seven monitoring wells were sampled per EPA Test Method 8240. The monitoring wells sampled included: TT-6, MW-5, MW-3, TT-3D, TT-5, TT-1 and TT-2. The groundwater sampling scheme included decon of all sampling equipment, collection of liquid level measurements before and after the well purging, purging of three well volumes from each well followed by a collection of groundwater samples. During the well purging, each well was monitored for pH, conductivity and temperature. The monitoring wells were subsequently sampled utilizing a disposable bailer. Subsequent to the groundwater sampling a final liquid level measurement was collected. Table 1 summarizes the liquid level data collected during the groundwater sampling event. Included as Attachment A are copies of the groundwater sampling work sheet for each monitoring well sampled.

October 7, 1997

- Three monitoring wells sampled included: MW-4, MW-4D, and TT-4. Monitoring wells (MW-1 and MW-1D) were purged on October 7, 1997; however, these wells were subsequently sampled on October 8, 1997. A duplicate groundwater sample was collected from MW-4. This sample was labeled "duplicate" and was collected on October 7, 1997. Please note that MW-7 could not be located and therefore was not sampled.

October 8, 1997

Monitoring wells MW-1 and MW-1D were sampled per EPA Test Method 8240. In addition, MW-16 was purged and subsequently sampled. A duplicate groundwater sample was collected from MW-16 on October 8, 1997 and was labeled "duplicate".

November 20, 1997

Fluor Daniel GTI's subcontractor Caribbean Hydro-Tech Inc. met with Aqua Design to collect groundwater samples from the two Vitelco wells (TEW-2 and TEW-2D). Prior to collecting groundwater samples approximately five well volumes were purged from these two wells. Approximately 200 gallons were purged from TEW-2; whereas, 400 gallons were purged from TEW-2D. The monitoring wells were subsequently sampled per EPA Test Method 8240. Please note that pH, conductivity, and temperature were not collected during the purging of these monitoring wells; however, approximately five well volumes were purged from these two wells prior to sampling.

December 4, 1997

Fluor Daniel GTI technician John Henriquez collected a full round of liquid levels on December 4, 1997 from the monitoring wells located in the vicinity of the Texaco Tutu Service Station. Table 2 summarizes the liquid level data and the depths to bottom of several monitoring wells. Please note that during the liquid level gauging event the Four Winds I well was pumping at approximately 16 gpm. The pump within this well was temporarily shut down for fifteen minutes to allow for groundwater recharge. After fifteen minutes of recharge a liquid level measurement was obtained and the pump was restarted. Fluor Daniel GTI's technician attempted to collect a liquid level reading from MW-2 several times throughout the day; however, during each attempt this well was covered by an automobile and therefore could not be gauged.

- Due to the presence of pumps and electric/plumbing lines located inside the Four Winds wells, depth to bottom measurements could not be collected because the pump's plumbing and electric lines prevented access to the well bottoms.
- Pursuant to Erler & Kalinowski, Inc.'s facsimile dated December 11, 1997 and a review of the map attached to this facsimile which included the location of VE-3, Fluor Daniel GTI has determined that liquid level data was collected from TT-4 was inadvertently collected from VE-3. In addition, please note that the monitoring well sampled during the groundwater sampling event is also actually VE-3 rather than TT-4.
- Included at Attachment B are sketches indicating the location from where liquid levels were collected from the TEW extraction wells.

ATTACHMENT A

TABLE 1
LIQUID LEVELS MEASUREMENTS
DURING GROUNDWATER SAMPLING EVENT
OCTOBER 6 - 8, 1997

Tutu Service Station
St. Thomas, USVI
Fluor Daniel GTI Project #100212

Well ID	Depth to Water - Static Liquid Levels	Depth to Bottom	Depth to Water - Liquid Levels after Purging Wells	Depth to Water - Liquid Levels after Sampling
MW-1 *	27.23	43	28.48	28.01
MW-1D *	29.15	87	86.6	84.73
MW-3	16.04	30	17.71	16.98
MW-4	10.61	28	11.88	12.04
MW-4D	11.58	89	13.24	11.88
MW-5	22.71	39	28.36	24.52
MW-16	27.41	46	28.87	27.91
TT-1	14.45	30	15.93	15.11
TT-2	13.92	29	15.81	15.27
TT-3D	15.62	53	17.82	15.87
TT-4 **	12.52	19	18.09	16.63
TT-5	17.59	30	19.11	18.82
TT-6	6.5	13	8.01	7.07

* = Monitoring wells were purged on October 7, 1997 and were subsequently sampled on October 8, 1997.
** = Liquid level data and groundwater sampling data collected for this well was actually for well VE-3.
Note: Monitoring well MW-7 could not be located, therefore was not sampled.

TABLE 2
LIQUID LEVEL MEASUREMENTS
DECEMBER 4, 1997

Tutu Service Station
St. Thomas, USVI
Fluor Daniel GTI Project #100212

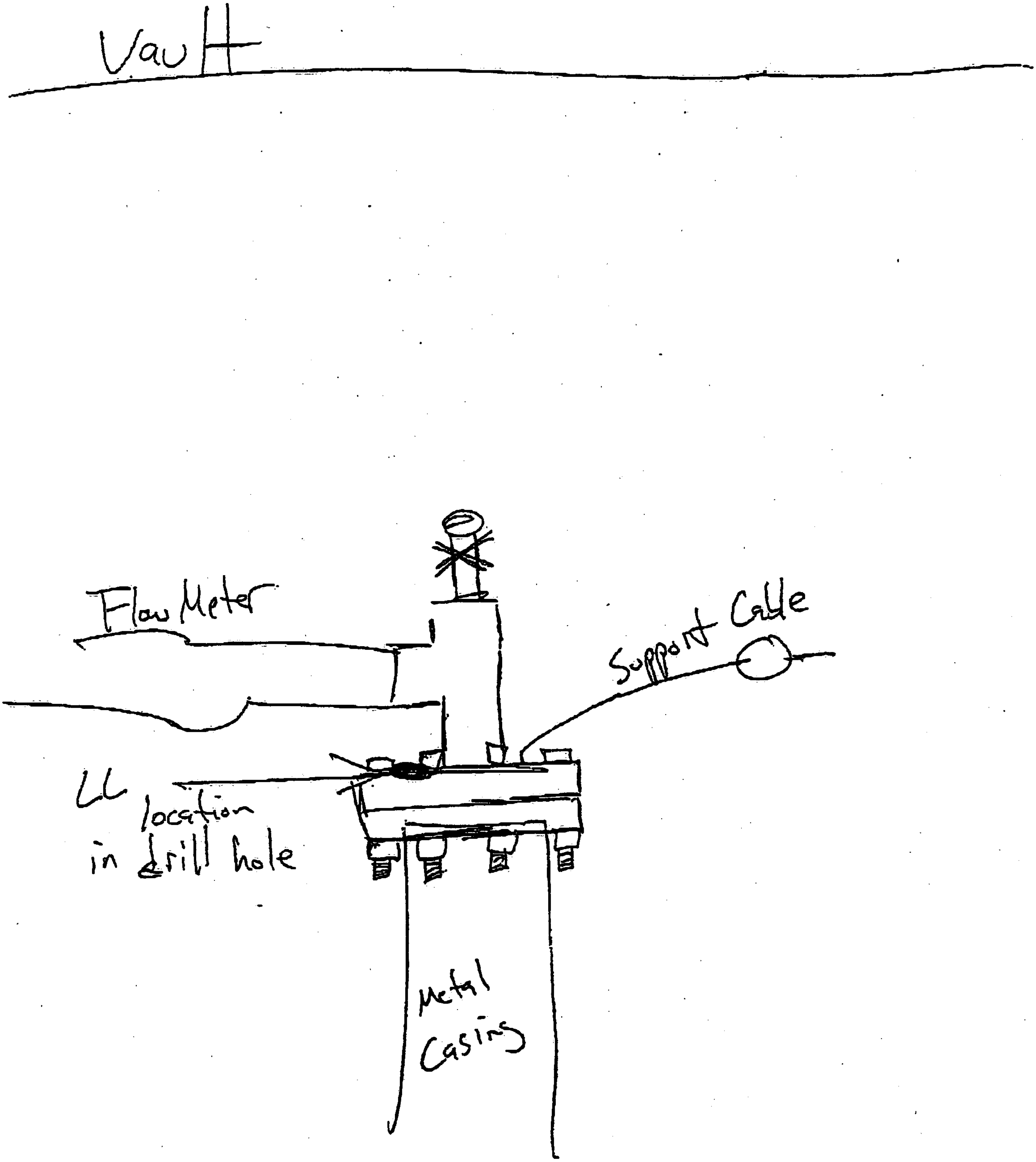
Well ID	Depth to Water	Depth to Bottom
CHT-1	16.06	29
CHT-4	10.59	25
CHT-6D	6.97	--
Four Winds II	9.87	--
Four Winds III	4.11	--
Four Winds I *	27.62	--
MW-1	22.95	43
MW-15	5.77	36
MW-16	24.46	46
MW-17	6.03	13
MW-1D	36.14	87
MW-2	Not Measured/ Covered by Automobile	
MW-3	14.12	30
MW-4	8.57	28
MW-4D	9.67	89

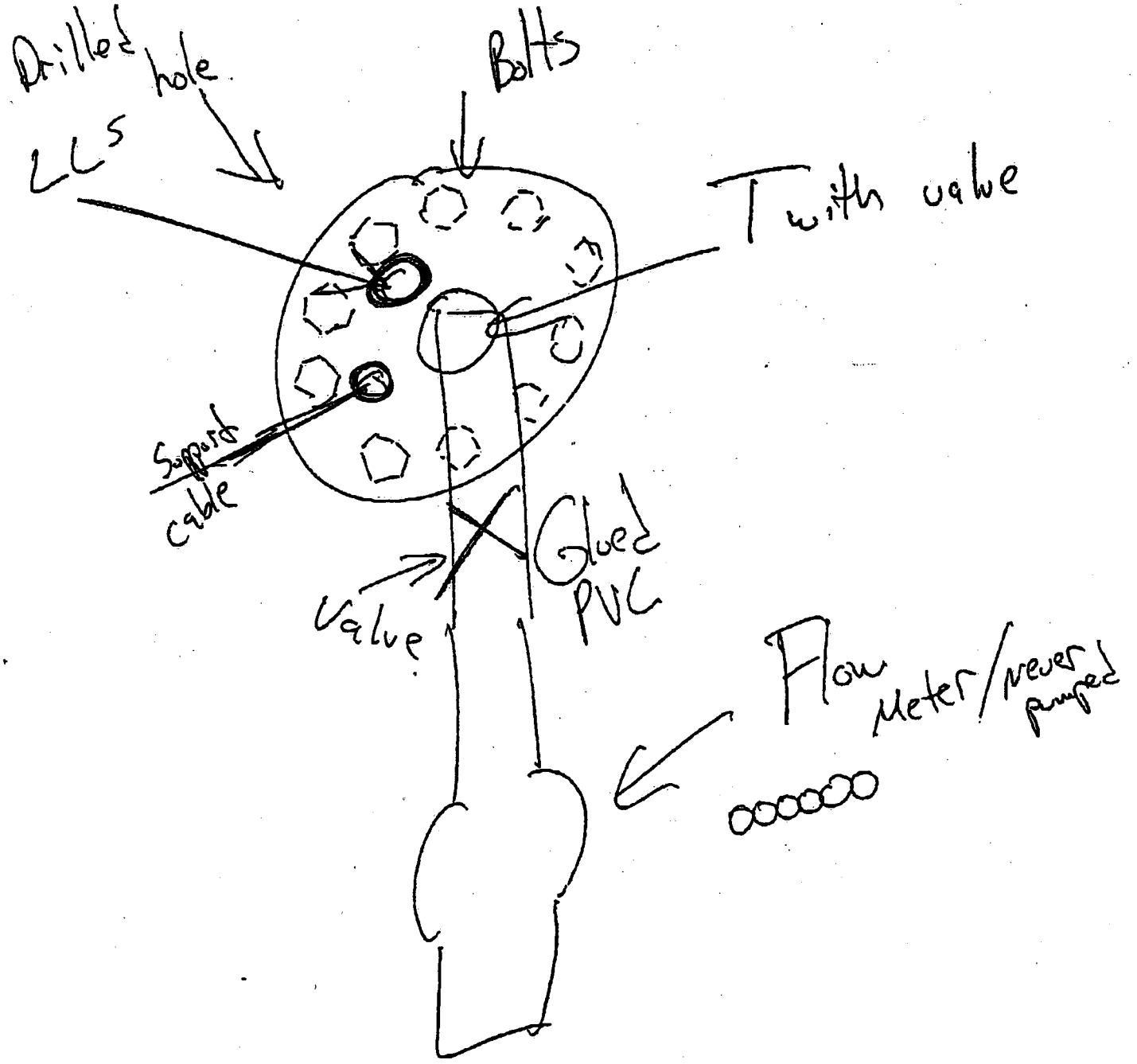
Well ID	Depth to Water	Depth to Bottom
MW-5	21.28	39
MW-6D	6.19	--
MW-6R	6.40	22
MW-7	Not Located	--
TEW-1D	10.87	65
TEW-1	10.89	41
TEW-2	14.46	41
TEW-2D	14.67	91
Tillet	22.71	--
TT-1	13.00	30
TT-2	12.14	29
TT-3D	13.68	53
TT-4 **	11.25	19
TT-5	16.02	30
TT-6	6.31	13

* = During the liquid level gauging event this well was pumping at approximately 16 gpm. The pump was temporarily shut down for fifteen minutes following which a liquid level measurement was obtained.

** = Liquid level data collected for this well was actually for well VE-3.

ATTACHMENT B


Vault
Flow Meter
Support Cable
LL location in drill hole
Metal Casing


Drilled hole
LC's
Bolts
T with valve
Support cable
Glued PVC
Valve
Flow Meter/never pumped

GROUNDWATER SAMPLING FIELD DATA FORM

CLIENT: **Texaco Caribbean**
SITE: **TuTu Service Station**
ADDRESS: **St. Thomas, USVI**

SAMPLE ID: JT-6
WELL TYPE: MW
CASING DIA (inches): 4"

Date: 10/6/97
Sampler: JH

Data No.	CUM. VOLUME (gallons)	TEMP. (deg. C.)	pH	COND.	NOTES:
1	4.3	34	6.93	1500	
2	4.3	32	7.01	1500	
3	4.3	32	7.07	1500	
4					
5					
Final	12.9	32	7.07	1500	

PURGE VOLUME TABLE: (area of casing x feet of water column) x 7.48 gal/cubic ft.

CASING DIAMETER	2 INCHES	4 INCHES	6 INCHES
Gallons / Foot	0.163	0.653	1.469

GROUNDWATER SAMPLING FIELD DATA FORM

CLIENT: **Texaco Caribbean**
SITE: **TuTu Service Station**
ADDRESS: **St. Thomas, USVI**

SAMPLE ID: MW-5
WELL TYPE: MW
CASING DIA (inches): 4"

Date: 10/6/97
Sampler: JH

Data No.	CUM. VOLUME (gallons)	TEMP. (deg. C)	pH	COND.	NOTES:
1	10.3	33	6.83	1500	
2	10.3	32	7.03	1550	
3	10.3	32	7.05	1550	
4					
5					
Final	30.9	32	7.05	1550	

PURGE VOLUME TABLE: (area of casing x feet of water column) x 7.48 gal/cubic ft.

CASING DIAMETER:	2 INCHES	4 INCHES	6 INCHES
Gallons / Foot	0.163	0.653	1.469

GROUNDWATER SAMPLING FIELD DATA FORM

CLIENT: **Texaco Caribbean**
SITE: **TuTu Service Station**
ADDRESS: **St. Thomas, USVI**

SAMPLE ID: MW-3
WELL TYPE: MW
CASING DIA (inches): 4"

Date: 10/6/97
Sampler: JH

Data No.	CUM. VOLUME (gallons)	TEMP (deg. C)	pH	COND	NOTES
1	9.1	33	6.54	1350	
2	9.1	32	7.04	1400	
3	9.1	32	7.08	1400	
4					
5					
Final	27.3	32	7.08	1400	

PURGE VOLUME TABLE: (area of casing x feet of water column) x 7.48 gal/cubic ft.

CASING DIAMETER	2 INCHES	4 INCHES	6 INCHES
Gallons / Foot	0.163	0.653	1.469

GROUNDWATER SAMPLING FIELD DATA FORM

CLIENT: **Texaco Caribbean**
SITE: **TuTu Service Station**
ADDRESS: **St. Thomas, USVI**

SAMPLE ID: TT-3D
WELL TYPE: MW
CASING DIA (inches): 2"

Date: 10/6/97
Sampler: JH

Data No.	CUM. VOLUME (gallons)	TEMP (deg. C)	pH	COND	NOTES
1	5.9	34	7.11	1450	
2	5.9	33	7.03	1500	
3	5.9	33	7.03	1500	
4					
5					
Final	17.7	33	7.03	1500	

PURGE VOLUME TABLE: (area of casing x feet of water column) x 7.48 gal/cubic ft.

CASING DIAMETER	2 INCHES	4 INCHES	6 INCHES
Gallons / Foot	0.163	0.653	1.469

GROUNDWATER SAMPLING FIELD DATA FORM

CLIENT: Texaco Caribbean
SITE: TuTu Service Station
ADDRESS: St. Thomas, USVI

SAMPLE ID: TT-5
WELL TYPE: MW
CASING DIA (inches): 4"

Date: 10/6/97
Sampler: JH

Data No.	CUME. VOLUME (gallons)	TEMP. (deg. C)	pH	COND.	NOTES
1	8.1	34	7.07	2000	
2	8.1	33	7.03	2000	
3	8.1	34	7.08	2000	
4					
5					
Final	24.3	34	7.08	2000	

PURGE VOLUME TABLE: (area of casing x feet of water column) x 7.48 gal/cubic ft.

CASING DIAMETER	2 INCHES	4 INCHES	6 INCHES
Gallons / Foot	0.163	0.653	1.469

GROUNDWATER SAMPLING FIELD DATA FORM

CLIENT: **Texaco Caribbean**
SITE: **TuTu Service Station**
ADDRESS: **St. Thomas, USVI**

SAMPLE ID: TT-1
WELL TYPE: MW
CASING DIA (inches): 4"

Date: 10/6/97
Sampler: JH

Data No.	CUM. VOLUME (gallons)	TEMP. (deg. C)	pH	COND.	NOTES
1	10.5	33	6.73	1800	
2	10.5	33	6.72	1800	
3	10.5	32	6.91	1800	
4					
5					
Final	31.5	32	6.91	1800	

PURGE VOLUME TABLE: (area of casing x feet of water column) x 7.48 gal/cubic ft.

CASING DIAMETER	2 INCHES	4 INCHES	6 INCHES
Gallons / Foot	0.163	0.653	1.469

GROUNDWATER SAMPLING FIELD DATA FORM

CLIENT: Texaco Caribbean
SITE: TuTu Service Station
ADDRESS: St. Thomas, USVI

SAMPLE ID: TT-2
WELL TYPE: MW
CASING DIA (inches): 4"

Date: 10/6/97
Sampler: JH

Data No.	CUM. VOLUME (gallons)	TEMP (deg C)	pH	COND.	NOTES:
1	10	31	6.96	1000	
2	10	31	7.01	1050	
3	10	31	7.07	1000	
4					
5					
Final	30	31	7.07	1000	

PURGE VOLUME TABLE: (area of casing x feet of water column) x 7.48 gal/cubic ft.

CASING DIAMETER	2 INCHES	4 INCHES	6 INCHES
Gallons / Foot	0.163	0.653	1.469

GROUNDWATER SAMPLING FIELD DATA FORM

CLIENT: **Texaco Caribbean**
SITE: **TuTu Service Station**
ADDRESS: **St. Thomas, USVI**

SAMPLE ID: TT-4
WELL TYPE: VE Well
CASING DIA (inches): 6"

Date: 10/7/97
Sampler: TH

Data No	CUM. VOLUME (gallons)	TEMP. C (deg. C)	pH	COND.	NOTES
1	10	38	6.99	1800	
2	10	36	6.94	1850	
3	10	36	7.01	1850	
4					
5					
Final	30	36	7.01	1850	

PURGE VOLUME TABLE: (area of casing x feet of water column) x 7.48 gal/cubic ft.

CASING DIAMETER	2 INCHES	4 INCHES	6 INCHES
Gallons / Foot	0.163	0.653	1.469

GROUNDWATER SAMPLING FIELD DATA FORM

CLIENT: **Texaco Caribbean**
SITE: **TuTu Service Station**
ADDRESS: **St. Thomas, USVI**

SAMPLE ID: MW-4
WELL TYPE: MW
CASING DIA (inches): 4"

Date: 10/7/97
Sampler: JH

Data No.	CUM. VOLUME (gallons)	TEMP (deg. C)	pH	COND.	NOTES
1	12	33	6.79	1600	
2	12	32	7.00	1600	
3	12	32	7.03	1600	
4					
5					
Final	36	32	7.03	1600	

PURGE VOLUME TABLE: (area of casing x feet of water column) x 7.48 gal/cubic ft.

CASING DIAMETER	2 INCHES	4 INCHES	6 INCHES
Gallons / Foot	0.163	0.653	1.469

GROUNDWATER SAMPLING FIELD DATA FORM

CLIENT: Texaco Caribbean
SITE: TuTu Service Station
ADDRESS: St. Thomas, USVI

SAMPLE ID: MW4D
WELL TYPE: MW
CASING DIA (inches): 6"

Date: 10/7/97
Sampler: JH

Data No.	CUM. VOLUME (gallons)	TEMP (deg C)	pH	COND	NOTES
1	113	32	7.97	1400	
2	113	31	7.15	1500	
3	113	31	7.07	1500	
4					
5					
Final	339	31	7.07	1500	

PURGE VOLUME TABLE: (area of casing x feet of water column) x 7.48 gal/cubic ft.

CASING DIAMETER	2 INCHES	4 INCHES	6 INCHES
Gallons / Foot	0.163	0.653	1.469

GROUNDWATER SAMPLING FIELD DATA FORM

CLIENT: Texaco Caribbean
SITE: TuTu Service Station
ADDRESS: St. Thomas, USVI

SAMPLE ID: MW-1
WELL TYPE: MW
CASING DIA (inches): 4"

Date: 10/7/97
Sampler: JH

Data No.	CUM. VOLUME (gallons)	TEMP (deg. C)	pH	COND.	NOTES:
1	17.8	34	7.03	1650	
2	17.8	33	6.97	1600	
3	17.8	33	7.07	1600	
4					
5					
Final	53.4	33	7.07	1600	

PURGE VOLUME TABLE: (area of casing x feet of water column) x 7.48 gal/cubic ft.

CASING DIAMETER	2 INCHES	4 INCHES	6 INCHES
Gallons / Foot	0.163	0.653	1.469

trmw / texaco tutu / 100212 / data.tbl / c:\tw\texaco\tutu\twp

12/10/97 17:25 [illegible]

GROUNDWATER SAMPLING FIELD DATA FORM

CLIENT: Texaco Caribbean
SITE: TuTu Service Station
ADDRESS: St. Thomas, USVI

SAMPLE ID MW-10
WELL TYPE MW
CASING DIA (inches) 6"

Date 10/7/97
Sampler: JH

Data No.	CUM. VOLUME (gallons)	TEMP (deg C)	pH	COND	NOTES
1	84	33	7.37	1550	
2	84	32	7.01	1500	
3	84	32	7.07	1500	
4					
5					
Final	252	32	7.07	1500	

PURGE VOLUME TABLE: (area of casing x feet of water column) x 7.48 gal/cubic ft.

CASING DIAMETER	2 INCHES	4 INCHES	6 INCHES
Gallons / Foot	0.163	0.653	1.469

lmw / texaco tutu / 100212 / data.tbl / c:\lw\texaco\tutu\wp

GROUNDWATER SAMPLING FIELD DATA FORM

CLIENT: **Texaco Caribbean**
SITE: **TuTu Service Station**
ADDRESS: **St. Thomas, USVI**

SAMPLE ID: MW-16
WELL TYPE: MW
CASING DIA (inches): 6"

Date: 10/8/97
Sampler: JH

Data No.	CUM. VOLUME (gallons)	TEMP (deg. C)	pH	COND.	NOTES:
1	26	33	7.58	1400	
2	26	30	7.18	1400	
3	26	30	7.16	1400	
4					
5					
Final	78	30	7.16	1400	:

PURGE VOLUME TABLE: (area of casing x feet of water column) x 7.48 gal/cubic ft.

CASING DIAMETER	2 INCHES	4 INCHES	6 INCHES
Gallons / Foot	0.163	0.653	1.469

GROUNDWATER SAMPLING FIELD DATA FORM

CLIENT: Texaco Caribbean
SITE: TuTu Service Station
ADDRESS: St. Thomas, USVI

SAMPLE ID: TEW-2
WELL TYPE: VE wells
CASING DIA (inches): 6"

Date: 11/20/97
Sampler: Wes Jamison — Caribbean Hydrotech

Data No.	Cum. VOLUME (gallons)	TEMP (deg. F)	pH	COND.	NOTES
1	40	—	—	—	
2	40	—	—	—	
3	40	—	—	—	
4	40	—	—	—	
5	40	—	—	—	
Final	200				=

PURGE VOLUME TABLE: (area of casing x feet of water column) x 7.48 gal/cubic ft.

CASING DIAMETER	2 INCHES	4 INCHES	6 INCHES
Gallons / Foot	0.163	0.653	1.469

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GROUNDWATER SAMPLING FIELD DATA FORM

CLIENT: Texaco Caribbean
SITE: TuTu Service Station
ADDRESS: St. Thomas, USVI

SAMPLE ID: TEW-2D
WELL TYPE: VE wells
CASING DIA (inches): 6"

Date: 11/20/97
Sampler: Wes Jamison – Caribbean Hydrotech

Data No.	CUM. VOLUME (gallons)	TEMP (deg.)	pH	COND	NOTES
1	100	—	—	—	Shallow well pumped 3x rate of deep well
2	100	—	—	—	
3	100	—	—	—	
4	100	—	—	—	
5					
Final	400				

PURGE VOLUME TABLE: (area of casing x feet of water column) x 7.48 gal/cubic ft.

CASING DIAMETER	2 INCHES	4 INCHES	6 INCHES
Gallons / Foot	0.163	0.653	1.469